NATIONAL CAR BUILDER

VOLUME XIII.
NUMBER 1.

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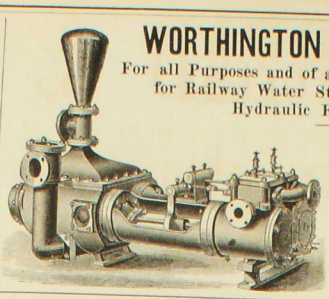

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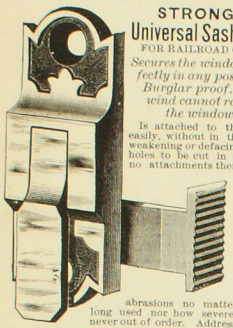

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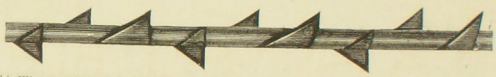

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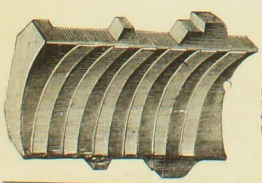

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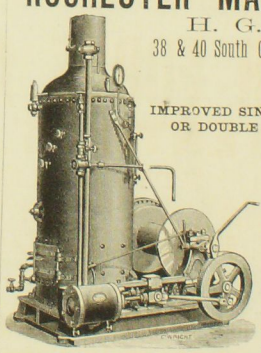

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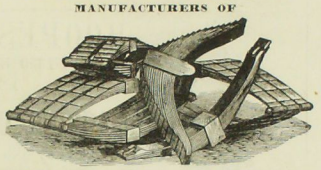
EXTRA TEMPERED,  LIGHT ELLIPTIC

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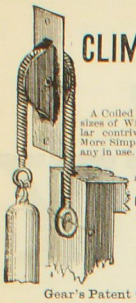

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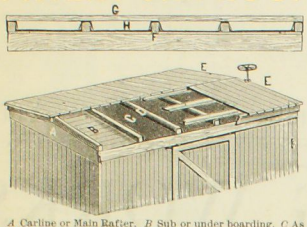

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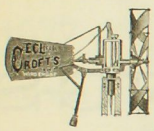

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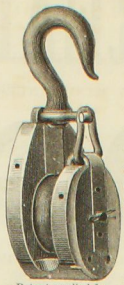

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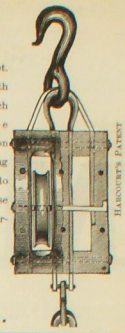

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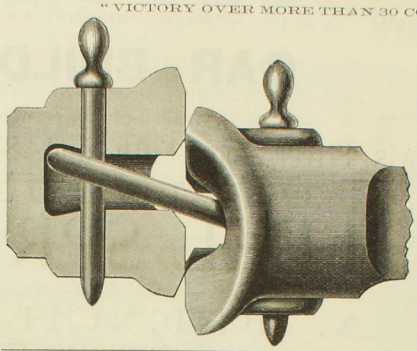

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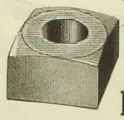

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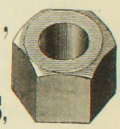

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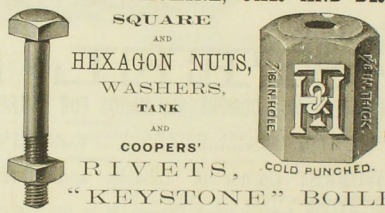

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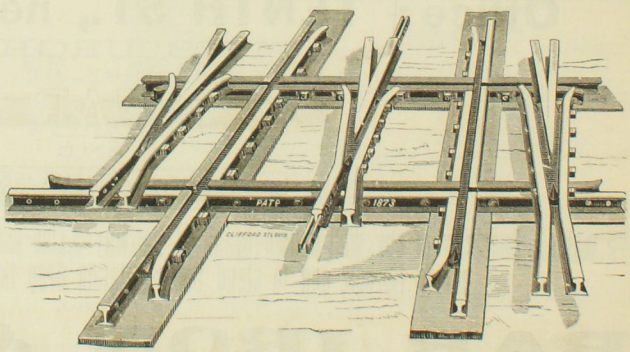
ELLIOT'S PATENT STEEL RAIL FROGS AND CROSSINGS.



These Frogs and Crossings are made of steel rail, combined with a wrought-iron frame, and bound together transversely with strong bolts, which give it great strength and durability without destroying its elasticity. They are connected at all ends by Fish-Plate Joints, and lie on the same tie surface as the running rail without any cutting of ties, thus saving a great deal of time and labor in putting in place in track.

Manufactured by H. & H. ELLIOT, East St. Louis, Ill.

LOWE'S METALLIC PAINT COMPANY, Chattanooga, Tenn.,

MANUFACTURERS OF

Lowe's Metallic Paint!

This Paint has now been before the public sufficiently long to establish its qualities as first-class Metallic Paint in every respect. It has covering properties superior to any other Metallic Paint made. IT TAKES ABOUT 18 PER CENT. LESS OIL THAN ANY OTHER METALLIC PAINT.

It is absolutely free from Sulphates of every kind and description, which in many other Metallic Paints prove so injurious to Iron and Tin Roofs. It is manufactured in a very superior manner by being reground and carefully prepared, and is entirely available for inside finish when dark colors are desired. Its natural color is a Uniform Dark Blood Red. It is WARRENTED NOT LESS THAN 55 PER CENT. METALLIC IRON, thus giving it a body excelled by no other Paint made. Its Fire Proof properties are excellent, and houses constructed of wood, and especially shingle roofs, are very materially protected by application of this Paint. It is not calcined nor burnt, consequently its color is unchangeable. We have Freight arrangements to nearly every city in the United States and Canada, and would name Prices delivered. Please read the Certificates hereto attached.

East Tennessee, Virginia & Georgia Railroad—Main Stem. / Office of General Superintendent, / Knoxville, Tenn., April 18, 1881.

S. B. Lowe, Chattanooga, Tenn.:
Dear Sir: * * * I will say that this company is using it both upon its Main Stem and Selma Division, and has found it perfectly satisfactory, and equal to any Lehigh Brown that we have used. It mixes well and spreads smoothly, and I find it much the cheapest paint that I can use for freight cars and such purposes. Very truly yours,
JNO. F. O'BRIEN, Gen'l Supt.

Wilkins, Post & Co., Engineers and Bridge Builders, / Atlanta, Ga., and 102 Broadway, N. Y. / Atlanta, May 16, 1881.

S. B. Lowe, Chattanooga:
Dear Sir: We have been using your paint on all the iron bridges that we are constructing on the M. & C., Georgia Western, and other railroads through the South, and find it of very superior quality *requiring less oil* and working with ease, and having excellent covering properties.
Respectfully, WILKINS, POST & CO,

Office of Peaslee, Gaulbert & Co., Manufacturers of / White Lead, Colors, Ready Mixed Paints, etc., / Louisville, Ky., April 15, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Dear Sirs: * * * Your Metallic Paint has given perfect satisfaction wherever we have placed it. In grinding we find it takes from ten to twenty-five per cent. less oil than various other brands of oxide of iron we have heretofore handled.
Very truly yours, PEASLEY, GAULBERT & CO.

King's Iron Bridge & Manufacturing Co., / Cleveland, O., May 25, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Gentlemen: We find your paint of first-rate quality for our use, and very economical. Yours truly,
KING BRIDGE CO.

Office of Scott & Co., / Manufacturers of Scott's Sheet Iron Roofing, / Cincinnati, May 4, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Gentlemen: We consider it as good as any that we have used during our experience of over nine years, and shall use it largely. Yours, etc.,
SCOTT & CO.

W. G. Hyndman & Co., / Manufacturers of Patent Sheet Iron Roofing, / Cincinnati, May 3, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Gentlemen: The paint which we received from you last month has given us perfect satisfaction. We regard it as the best iron ore paint that we have ever used.
Respectfully yours, W. G. HYNDMAN & CO.

P. S.—Please forward us immediately two (2) tons more on our order.
Wason Car and Foundry Co., / Chattanooga, Tenn., May 3, 1881.

S. B. Lowe, City:
Dear Sir: For some time past we have been using the Lowe Metallic Paint upon all the cars built at our shops, and, as it gives entire satisfaction to our customers, it is our purpose to continue the use of it. F. F. MORRILL, Sec'y.

Cincinnati, Hamilton & Dayton R. R. Co., / Operating the / Dayton & Michigan, Cin'ti, Richmond & Chicago, / and C. H. & I. R. Rs. / W. H. H. Allison, Master Car-Builder. / Cincinnati, June 14, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Gentlemen: We have been using your Metallic Paint on freight cars, at our shops, for the last four months, and find it a better paint than we ever used for that purpose.
Yours respectfully, W. H. H. ALLISON.

Laboratory of Fred P. Dewey, / Chemist to Roane Iron Co., / Chattanooga, Tenn., April 6, 1881.

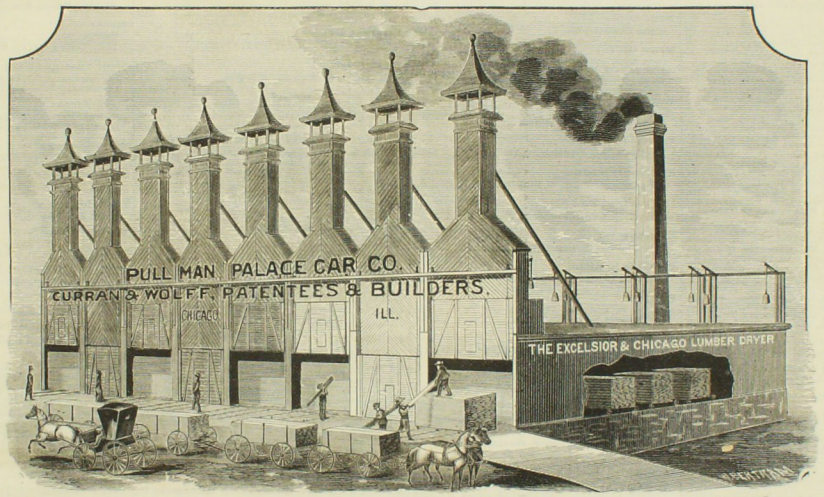
S. B. Lowe, Esq.:
Dear Sir: I have given samples of your paint ore a careful analysis with a special view of ascertaining if there is any substance in it calculated to prove injurious to tin or iron roofs, and am free to say that I find it remarkably free from sulphides of every kind, or anything else that could prove injurious to either tin or iron roofs. Yours respectfully,
FRED P. DEWEY, Ph. B., Analytical Chemist

Office of Norton & Wieder, / Paints, Oils, Varnishes, Glass, Sash, Doors and Blinds, / St. Louis, May 30, 1881.

Lowe's Metallic Paint Co., Chattanooga, Tenn.:
Gentlemen: We have used and sold—in the course of the past year—enormous quantities of your Metallic Paint, and we find that less oil is required for yours than for other Metallic Paints. Yours truly, NORTON & WIEDER.

THE EXCELSIOR AND CHICAGO LUMBER DRYER is Built under 16 Patents.

PAYS FOR ITSELF EVERY YEAR. Storing Capacity, 40,000 feet Inch Lumber.



DRYING 1,000 FEET PINE LUMBER EVERY 24 HOURS.

RAILROAD COMPANIES AND CAR-BUILDERS WHO ARE USING THE EXCELSIOR AND CHICAGO LUMBER DRYER.

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Pullman Palace Car Company, Chicago	8
Wells & French Co., Chicago	3
C. & N. W. Railroad, Chicago	3
Flint & Pere Marquette R. R., Saginaw	1
Peninsular Car Works, Detroit	1
Michigan Car Company, Detroit	2

	No. of Dryers.
Memphis & Charleston Railroad, Memphis	1
Ohio Falls Car Company, Jeffersonville, Ind	2
Indiana Car Company, Cambridge City, Ind	1
Haskell & Barker Company, Michigan City, Ind	1
Denver & Rio Grande Railway, Denver, Col	2

	No. of Dryers.
Atchison, T. & S. Fe Railway, Topeka, Kan	1
Barney & Smith Company, Dayton, O	4
Missouri Car & Foundry Co., St. Louis	1
Blain Bros., Huntington, Pa	1
U. S. Rolling Stock Co., Chicago	2

CURRAN & WOLFF, Proprietors and Builders, 39 and 41 FRANKLIN STREET, CHICAGO, ILL.

AJAX METALS,

Especially Adapted for LOCOMOTIVE, CAR, ROLL-NECK and MACHINERY BEARINGS, and for Pump-Rods, Valves, Plungers, etc., for Mine Use where sulphurous water and acids are found.

LETTERS PATENT have not been taken out, so that any one using our goods runs no risk of being associated with any lawsuit. **NO INTERFERENCE** can be filed against the use of Ajax Metal: on the contrary, letters of recommendation from the leading steel and iron mills, foundries and machine shops of this country are shown upon application. Also reports of tests as made by MASTER CAR-BUILDERS and MASTER MECHANICS, who are acknowledged AUTHORITY. Full information given on application to

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SIBLEY'S PERFECTION VALVE OIL.

More perfect lubrication insured, and entire freedom guaranteed from corrosion of cylinders and destruction of steam joints by fatty acids.

In exclusive use on 50 railroads.

References and prices furnished upon application.

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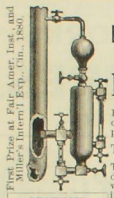
FRANKLIN, PA.
J. C. SIBLEY, President.



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Lubricator Mfg. Co.'s
CONTINUOUS FEED
LUBRICATOR CUPS

For oiling valves and cylinders of steam engines, by the only perfect method,

Through the Steam Pipe.

The oil passes *in sight*, drop by drop, into the column of steam, where it vaporizes, thus becoming a *steam lubricant*, oiling perfectly every part reached by the steam. Any *clean oil*, black or white, light or heavy, may be used. Saves from 50 to 90 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on 20 days' trial if desired. In ordering give diameter of cylinder. Address

DETROIT
LUBRICATOR MFG. CO.
Office, 89 Griswold St.,
DETROIT, MICH.

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The first Lubricators ever made, showing the oil passing drop by drop thro' a transparent water chamber were devised by us, and the same are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above feature, made by other parties, are encroachments upon our rights, and we will hold purchasers and users, as well as manufacturers, responsible in damages for such violations.

NOTE.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their "sight feed" feature, a decree was rendered in our favor Aug. 20, 1881.

Please mention this paper.

THE STANDARD LUBRICATING OIL OF AMERICA
FOR RAILROADS.
GALENA
ENGINE, COACH AND CAR OIL.

Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° below zero.

No freezing in coldest weather, and entire freedom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.

Showing Better Results than any Oil Extant.

REFERENCES FURNISHED ON APPLICATION.

GALENA OIL WORKS (Limited),
FRANKLIN, PA.

WE INVITE ATTENTION TO THE WONDERFUL LUBRICATING AND LASTING PROPERTIES OF THE

FRAZER TALLOW COMPOUND,

being especially adapted to passenger or fast-moving trains. Its consistency is scarcely changed by the extremes of heat and cold, having been used and tested for many years by important roads in the extreme Northern States, as well as by leading roads in the Cotton States of the South. The great advantages in its use are economy and exemption from hot boxes. We also offer the

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for freight or slow-moving trains. This grease will be found, from its great durability, to be more economical than common oils.

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FOR COOLING AND LUBRICATING HOT JOURNALS.

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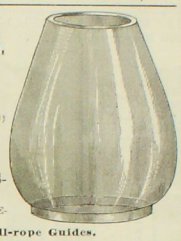

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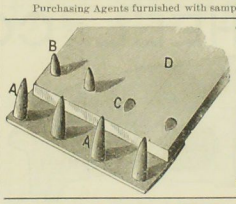

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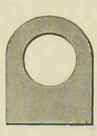

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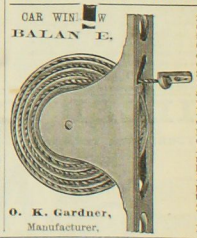

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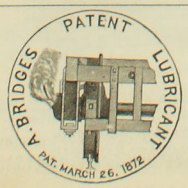

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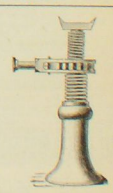

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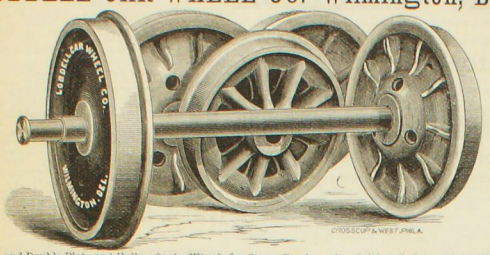

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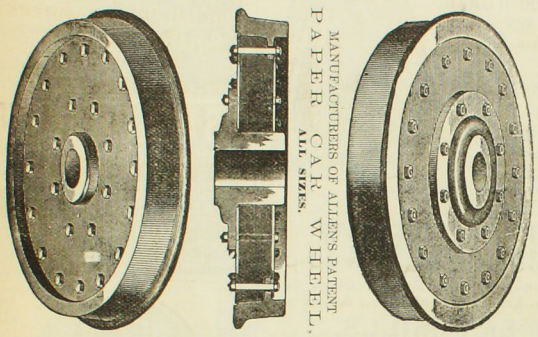

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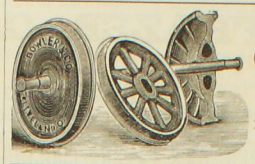

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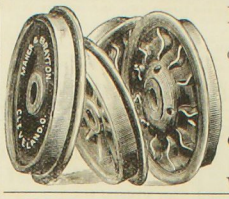

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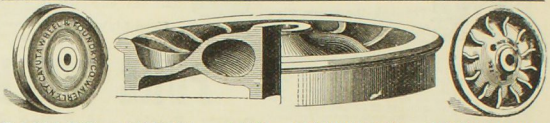

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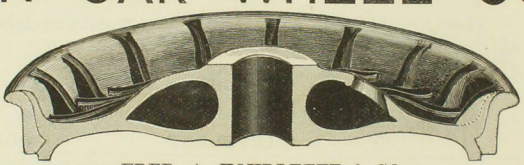

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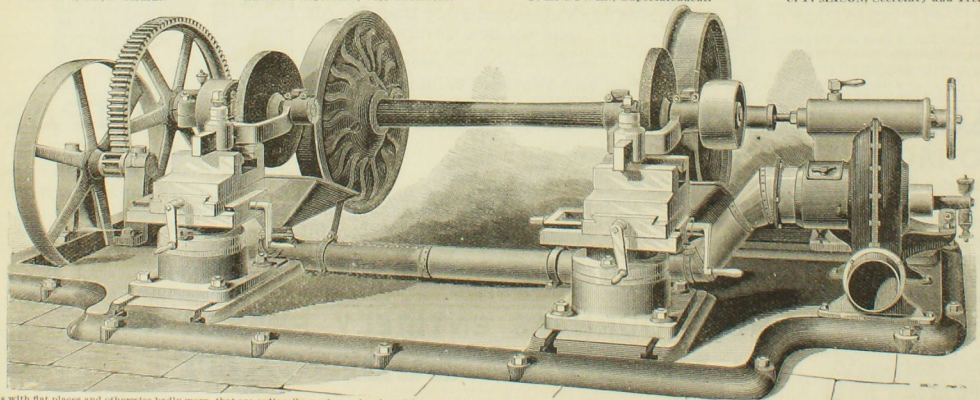

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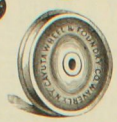

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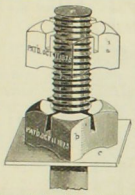

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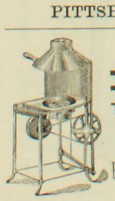

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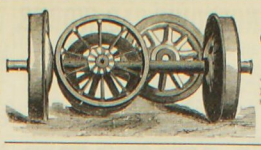

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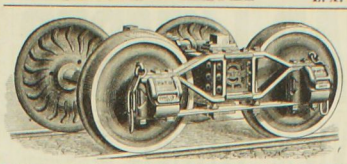

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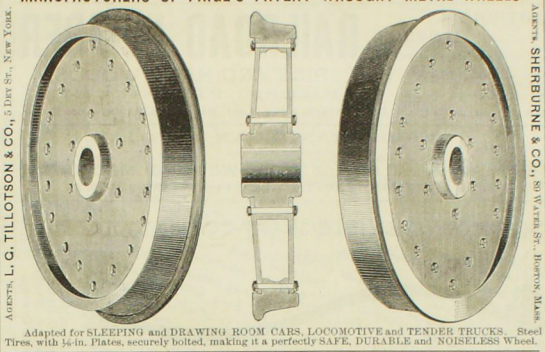

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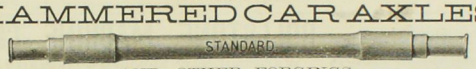

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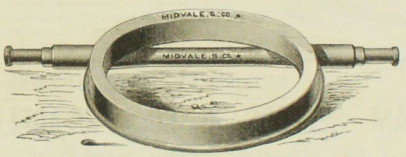

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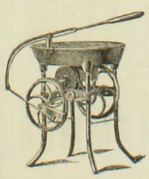

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THE WESTERN WITH BELTS AND LEVER HANDLE. CHEAPEST MADE.
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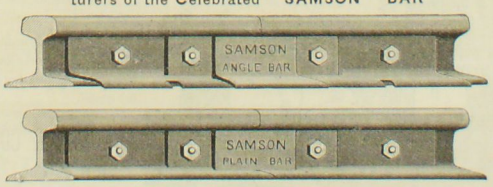

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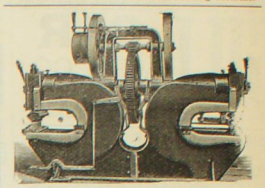

Power Punches, Shears & Hammers.
We make over 100 sizes of Punches and Shears, Double and Single, varying from 500 to 30,000 pounds in weight, and adapted forevery variety of work. The Double machines are equal to two Single ones, as each side is worked independently. Also
ADJUSTABLE HELVE CUSHIONED HAMMERS
Of all sizes, Unequaled for Efficiency and Durability.
THE LONG & ALLSTATTER CO.,
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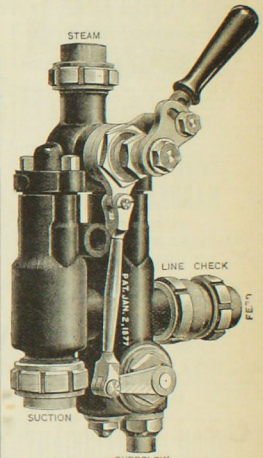
THE IMPROVED
HANCOCK INSPIRATOR
FOR
LOCOMOTIVES.



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34 BEACH STREET,
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RUMSEY & CO. [Limited],

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More than 50 Railway Companies have them in use.
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FIRE ENGINES, ETC., ETC.
ASK FOR
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MANUFACTURERS OF

FREIGHT CARS,

CAR WHEELS,

AND

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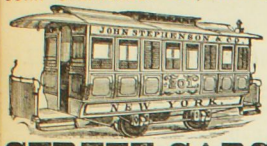
GILL CAR M'F'G CO.,

Columbus, Ohio.

Make the best CARS and WHEELS.

JOHN STEPHENSON CO., Limited,



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J. M. JONES & CO.,

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Our Cars have all Late and Valuable Improvements. Are noted for Light Running and Easy Riding. Combining Lightness and Strength with Beauty in Design and Finish. Our large Facilities Enable us to Fill Orders Quickly and at the Lowest Prices for Superior Quality.

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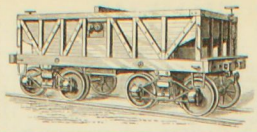

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Railroad Freight Cars, Broad and Narrow-Gauge.

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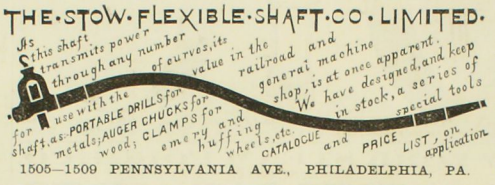
THE·STOW·FLEXIBLE·SHAFT·CO·LIMITED·



The Flexible Shaft is now used by 70 Railroads and 7 Locomotive Works in the U. S. and Canada.

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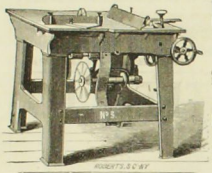

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Wardwell Saw Benches a specialty.

These machines are in use in the car-shops of the Penn. R. R., B. & O., P. W. & B. R. & A. F. R., Mich. Central, and some fifty other of the largest shops in the country

Also, A HEAVY BAND SAW FOR CAR WORK.

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And a large number of other machines for car work.

We are dealers in all kinds of Second-Hand Machinery, Engines, Boilers, Iron and Wood-Working Machinery.

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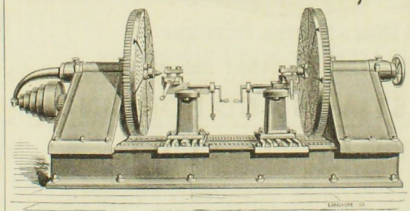

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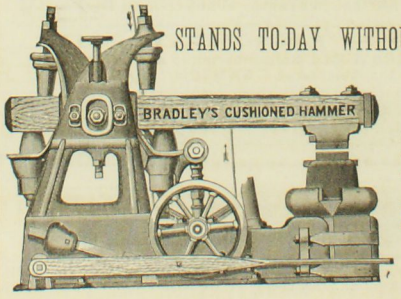
STANDS TO-DAY WITHOUT AN EQUAL.



It approaches nearer the action of the Smith's arm than any hammer in the world.

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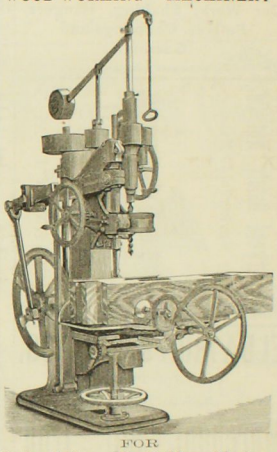

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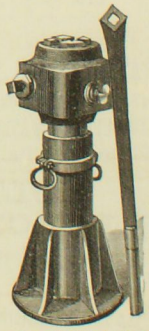

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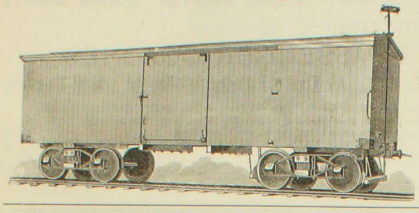

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FREIGHT
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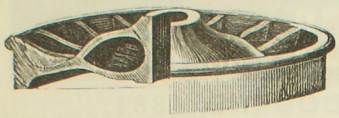
OF EVERY DESCRIPTION.
WHEELS
For Freight, Locomotive Truck, Tender, and Passenger Service.
HAMMERED AXLES and other forgings.
CAPACITY:
16 Box-Cars per Day,
250 Wheels per Day.
Wheels Fitted to Axles, and Prices Furnished on Application.



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WITH ALL DESIRABLE IMPROVEMENTS.

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CAR WHEELS A SPECIALTY IN THE MACHINERY DEPARTMENT.

Especial attention is given to furnishing Hoisting Engines, Pit Cars, Dumps, etc., etc., for Coal Mines, as well as building Stationary Engines and Boilers, and General Brass and Sheet-Iron Work.

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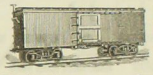

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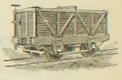

Mail, Baggage, Box, Gondola, Flat, Gravel, Ore, Coal, Mine and Hand Cars, Kelley's Patent Turn-Tables and Centres for Wooden Turn-Tables, Car Castings, Railroad Forgings, Rolling-Mill Castings, Bridge Bolts and Castings.

We have in connection with our Car Works an extensive Foundry and Machine Shop, and are prepared to do a general Machine Business.

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Also Freight Car, Caboose and Bridge Paints Ready for Use. Fine Brushes for Railroad Car and Coach Painting. All Kinds of Painters' Supplies and Artists' Materials.

Railroad Companies will save themselves great trouble in painting by allowing F. W. Devoe & Co. to prepare their Passenger and Freight Car Colors. This will insure DURABILITY, UNIFORMITY and ECONOMY. As we manufacture from the crude materials, which are the component parts of any shade, we understand better their chemical relationship, when in combination, than can be possible to those who simply buy their dry materials and then grind them. SEND FOR CATALOGUES AND LISTS OF SAMPLE COLORS.

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MANUFACTURERS OF RAILWAY CAR VARNISHES.

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THE INTERNATIONAL EXHIBITION MELBOURNE, 1881.

First Order of Merit Awarded to

VALENTINE'S VARNISHES.

We have been pleased to receive the following announcement from our representatives in Melbourne, Australia:

MELBOURNE, AUSTRALIA, March 21, 1880.

MESSRS. VALENTINE & CO., NEW YORK:

GENTLEMEN: By this we have the pleasure to inform you that your exhibit of Varnish has the honor to rank in the highest place in our International Exhibition, and stands alone for the first Order of Merit for Varnish by itself without any other goods to help it; and it is the only Varnish that has obtained *First Order of Merit against all comers.* We congratulate you upon the position you take, for the competition was great. Some of the English makers have magnificent shows, got up regardless of expense, and you may fancy we have been interested in the result, but were confident; and what makes it more valuable is the fact that it is the only First Order of Merit for Varnish *alone*, which was secured without your Varnish being exhibited in connection with other goods, to make the exhibit more attractive to the eye. * * *

Yours truly, (Signed) HENRY BOX & SON.

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CHICAGO. NEW YORK. PARIS

ESTABLISHED 1845.

MOSES BIGELOW & CO., NEWARK, N. J.

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PARKER CEMENT PAINT.

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3,000 TO 5,000 BBLS. SOLD YEARLY.

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SPECIAL MANUFACTURERS OF

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RUBBER ROOFING.

Weight but 60 pounds to 100 square feet, and is the cheapest and lightest Roof that can be put on. It can be laid by any one, and is superior to all other Roofing for cheapness, fire-proof qualities and durability. Being ready for use, very elastic, and requiring no tar or gravel, is strongly recommended by architects, corporations, public institutions, builders and leading men in all sections, for new, steep or flat roofs. Can also be laid over very old shingles, with positive satisfaction. Will not smell in hot weather, sheds water rapidly, handsome finish, is as nearly fire-proof as it is possible to make any roofing, and is as durable as any tin roof under similar conditions.

Price, $3.25 per square of 10 by 10 feet. This includes everything complete for a New Roof. Send for Circulars giving further particulars.

INDIANA PAINT AND ROOFING CO., Indianapolis, Ind.

THE NATIONAL CAR-BUILDER,

PUBLISHED MONTHLY AT NO. 5 DEY ST., NEW YORK.

PAID CIRCULATION, 9,000 COPIES,

A LARGER CIRCULATION

THAN ANY OTHER RAILROAD PAPER IN THE WORLD.

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THREE CANVASSERS FOR SUBSCRIPTIONS,

Whereby we are enabled to Guarantee to our Advertisers at least 500 New Subscribers Each Month, making it the

BEST RAILROAD PAPER TO ADVERTISE IN.

REACHING ALL RAILROAD OFFICERS OF THE OPERATING DEPARTMENTS IN THE UNITED STATES AND CANADA.

We are permitted to publish the following letter, one of many we have received of similar purport:

BOSTON & ALBANY RAILROAD COMPANY, ALLSTON, MASS., Jan. 31, 1881.

R. M. Van Arsdale, Esq., Proprietor National Car-Builder, 5 Dey street, New York:

DEAR SIR: Inclosed please find one dollar in renewal of my subscription to your paper. I am much pleased with its manifest improvement during the past year, making it more and more valuable for the information it contains in the interest of railway rolling stock; and I also think it is the best paper for the use of business men in reaching the supply departments of railroads. Wishing you continued success, I am

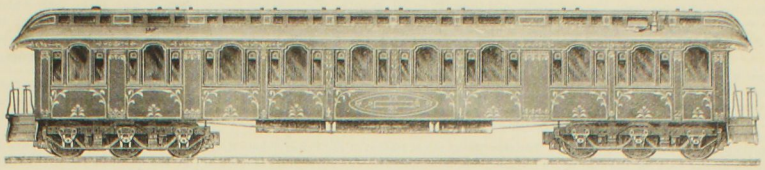
Yours truly,

F. D. ADAMS, Master Car-Builder Boston & Albany R. R.

SUBSCRIPTION, ONE DOLLAR PER YEAR.

ADVERTISING RATES AND OTHER INFORMATION MAY BE HAD AT THE OFFICE.

THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XIII.
NUMBER 1.

JANUARY, 1882.

SINGLE NUMBERS, TEN CENTS.
$1.00 PER ANNUM.

Miscellaneous Items.

MR. FRANK BRADLEY has been appointed Superintendent of the Detroit shops of the Pullman Car Co.

THE Allen Paper Wheel Co. has been awarded a gold medal by the Boston Exhibition for the strongest, safest, and most perfect car wheel in use.

THE Wagner Sleeping Car Co. has now in course of construction 34 palace sleepers to be placed on the Michigan Central and New York Central roads.

THE machine shops of the New Brunswick & Canada Railroad, at St. Andrews, N. B., were recently destroyed by fire. Loss $60,000; insurance slight.

THE Columbus, Hocking Valley & Toledo road has purchased ground at Logan, Hocking County, Ohio, for the erection of extensive car and repair shops.

MR. WM. RUSHTON, for many years Master Mechanic of the Atlanta & West Point road, and a member of the Master Mechanics' Association, died at Atlanta, Ga., Nov. 24.

THE Hebbard Car Spring Co., Knoxville, Tenn., will have their new shops completed and in running order by Jan. 15. They will manufacture all kinds of steel car springs.

THE National Car Co., St. Albans, Vt., whose cars run chiefly on the Central Vermont and Grand Trunk lines, has decided to build shops in which to repair its own cars and build new ones.

THE machine shop of the Cleveland, Tuscarawas & Wheeling road, at Lorain, Ohio, was destroyed by fire on the 19th ult. The loss on shop and contents is estimated at $50,000; no insurance.

THE single driver fast passenger locomotive built at the Baldwin Works a year and a half ago for the Reading Railroad Co., and tried on the Bound Brook line, has been taken to pieces preparatory to being sent to England.

THE Mason Machine Co., Taunton, Mass., are testing an engine recently manufactured by them, on the Old Colony Railroad, which is of sufficient power to draw 60 freight cars. The engine was built for a Western railroad.

THERE were built at the shops of the Boston & Albany R. R., during the year ending Sept. 30, 105 house freight cars, 62 coal and flat cars, 1 wrecking tool car, 11 passenger, 2 baggage, 2 drawing-room, and 3 sleeping cars, and 5 locomotives.

THE Pittsburg, Cincinnati & St. Louis road's shops, at Steubenville, Ohio, besides doing a large amount of repairs in the last year year, built about 200 freight cars and 12 coaches. The latter are finished in Eastlake style and heated by Winslow's safety car stoves.

THE Wabash, St. Louis & Pacific R. R. Co. has 3,300 miles of road, and the calls for stray baggage do not average over two a day. During the last two years the company has not paid for a single piece of baggage lost through the carelessness of employés.

MR. JOHN MARQUIS, formerly the master car-builder of the Pittsburg, Ft. Wayne & Chicago road, who died recently at Alleghany City, was widely known in railway circles, and highly esteemed for his excellent personal qualities and marked ability in his particular vocation.

THE Lehigh Car & Manufacturing Co., at Stemton, Pa., has contracted to build 750 box and other cars for a Western road, and has 500 cars, mostly box, to make on old orders. The works are running day and night. The company is erecting an additional machine shop, 30×50 feet.

THE Gilbert Car Works, in Buffalo, N. Y., have been adding to the shops, which now have a capacity of 10 freight cars a day. Besides a large order from the Buffalo, New York & Philadelphia the works have lately taken an order for 800 box and coal cars for the New York, Lake Erie & Western road.

MR. TREMAINE, a conductor on the Chicago, Milwaukee & St. Paul road, has devised a new brake which is now being put on a new passenger train on that road for trial. It is intended to prevent the sliding and flattening of wheels. The improvement consists in putting a heavy elliptic spring behind the brake-shoe.

THE Columbia Car Spring Company received the medal of excellence for its exhibit of Hebbard, elliptic, volute, round-bar, edge-rolled, and other car and locomotive springs at the late fair of the American Institute in New York. The company also received the silver medal for its exhibit at the Cincinnati Exhibition.

THE new car shop of the Union Pacific road, at Omaha, will, when completed, be the largest building in that city, and one of the largest car shops in America. It rests upon piles, and its main floor is, strange to say, six inches below the high-water mark of last spring; but the builders hope the river will never rise so high again.

THE railway stations of Austria are as nearly perfect as human ingenuity can make them. Those in Vienna are especially remarkable for the beauty of their interior decoration; for the handsome stones and marbles employed in the staircases and in the arcades; for the beautiful maps, veritable works of art, which are painted on the walls, and for the civility and intelligence of their employés.

THE Allegheny (Pa.) shops of the Pittsburg, Ft. Wayne & Chicago road have built during the past year 800 freight, 20 way, 2 mail and express, one baggage and smoker, and 4 passenger cars. The latter are 50 feet long and have 6-wheel trucks. There have been repaired at the shops during the year 1,900 freight and 140 passenger train cars; and the locomotive shops are now building two 10-wheel engines a month.

THE Chicago Locomotive Works have been incorporated with a capital of $1,000,000, and, it is stated, have purchased several hundred acres of land in the northwest corner of Chicago, near the junction of the Milwaukee and Chicago & Pacific divisions of the Chicago, Milwaukee & St. Paul road, upon which works are to be speedily erected. There are to be twelve buildings of brick, and it is hoped to commence manufacturing by June next.

THE Cumberland & Pennsylvania Railroad locomotive shops, at Mt. Savage, Md., are in such good condition and so well equipped with machinery and appliances, that they are able to take orders and turn out one new engine a month for other roads, besides keeping the rolling stock of their own road in good repair. The company is now engaged on a contract for seven locomotives for one road. This is a new departure in locomotive building.

THE coroner's jury in the case of the Jersey City boiler explosion suggests that immunity from the danger of boiler explosions can be secured with the least expense to the steam user by obtaining a policy of insurance against explosion in some reputable company, organized to make guaranteed inspections of steam boilers, who will send a carefully trained inspector to make periodical examinations of the boilers, setting and connections.

A MINIATURE steam engine, constructed by an ingenious clockmaker, is said to weigh only 15 grains, and can be entirely covered by an ordinary thimble. The stroke of the piston is a little over $\frac{1}{10}$ of an inch, and its diameter proportionately less. The whole machine consists of 140 distinct pieces fastened together by 52 screws; and three drops of water are sufficient to fill the boiler and set the mechanism in motion. The size of this engine has probably shrunk a trifle in the description.

THE Southern Car Works, at Knoxville, Tenn., are about completed and ready to begin work. There are five buildings in all, well constructed and supplied with the best of machinery and other appliances. The wood-working machinery is all from the establishment of J. A. Fay & Co., of Cincinnati. Only freight cars will be made at present, the maximum capacity of the works being equal to twenty cars a day. A force of 200 men will be employed. Mr. A. P. Case, recently of the Michigan Car Co.'s works, at Detroit, and with an experience of fifteen years in the business, is the superintendent.

MR. RICHARD GRANT WHITE, a recognized authority in the right use of words, says there is no reason or justification for calling a railway station a "depot." He also says that "railway" is to be preferred to "railroad." We think he is right in both cases; and as uniformity is desirable in railway terminology as a mere matter of convenience, we hope Mr. White's suggestions will not pass unheeded. In this connection we would say that the use of the word depot for station, although manifestly absurd, is not quite as supremely ridiculous as it is to call some of the new street thoroughfares in New York "boulevards."

THE Baltimore & Ohio Railroad Company's report for the year ending Sept. 30 says: "The condition of the tracks and engines has been brought to a high standard. New and splendid sleeping coaches, parlor and thoroughfare cars have been added, replete with every modern improvement and convenience, so that the company now furnishes an equipment unsurpassed for comfort and elegance. The hotels owned by the company are in superior order, and continue to be managed with exclusive regard to the advantage and enjoyment of its guests. Their attractions, combined with moderate charges, have been greatly appreciated by the public."

TWO new Pullman sleepers, the "Marmion" and "Lochinvar," have been placed on the Wabash line between Chicago and St. Louis. Each contains 14 sections, a smoking-room, and two elegant dressing apartments, and are finished wholly in mahogany, inlaid with a variety of light woods. The carpeting is a heavy body Brussels, and the curtains are of heavy damask. Special pains have been taken in the upholstery of the seats, rendering them as comfortable and inviting as one could wish. Six double hurricane lights illuminate the car, making it as brilliant as day, and a massive mirror at one extremity, reflecting, and, consequently, apparently doubling the interior, adds much to its general attractiveness.

THE meeting of the Connecticut Railroad Commissioners for the purpose of examining car couplers—to which we referred in our last issue—was not attended with any marked result, so far as we can learn. The number of couplers exhibited was very small as compared with the number of patents issued. The names of each are given in the Hartford *Courant* of Nov. 30. From the running comments in that paper on the several devices, it would seem that the Ames, Safford and Perry couplers were regarded with the most favor. The commissioners are to make a report to the legislature at its next session, but it can hardly prove a very satisfactory one, if based on the information derived from this meager exhibit.

THE annual report of the Boston & Albany Railroad Company for the year ending Sept. 30, 1881, shows net income or excess of receipts over expenditures for the year to be $2,186,873, out of which an 8 per cent. dividend has been paid, amounting to $1,600,000. The total surplus is $2,588,538. The increase of passengers carried one mile is 22,266,728 over last year; increase of freight tons carried one mile, 41,655,808; cost per ton and per passenger per mile $\frac{4.5.7}{10.0}$ cents. The receipts from freight fall off about $200,000, while the tonnage increased 283,000 tons, the loss in receipts being due partly to trunk line competition, and partly to reductions in local tariffs. The company at date of report had 242 engines of all classes, 243 passenger train cars, 5,107 merchandise cars, 631 other cars, and 11 snow plows.

THE St. Paul (Minn.) *Pioneer Press* reports that President Villard, of the Northern Pacific, has recently completed a contract with Thomas L. Edison for the construction of 50 miles of railroad in Minnesota during the next year, upon which Mr. Edison is to test the efficiency of his electrical engines as a motive power for railroads. It is stated that Mr. Villard agrees to pay Edison a stipulated sum for the entire road if the new power works satisfactorily, and the latter will be backed in his novel enterprise by capitalists abundantly able and willing to risk large amounts in making an experiment, of the entire success of which the inventor seems entirely confident and certain. Under the terms of the contract entered into, the 50 miles are to be completed within the year, and if the electric motors do not prove satisfactory, the greater portion of the cost will be borne by Mr. Edison and the gentlemen associated with him.

THE Mekarski Compressed Air Motor is about to be tried on one of the Philadelphia street railways, and the claim is made that it is destined to supersede animal power on street railways everywhere, with a great increase of comfort to passengers and of dividends to stockholders. This motor has been used in Nantes, France, for over three years, running through the busiest parts of the town. In Paris it operates two lines, and contracts for its use are

said to have been made in England with 17 horse-car companies. The plan is claimed to be also especially adapted to elevated railways, being cheaper than steam power. The invention simply consists in passing dry air through water heated to a temperature of 330° Fahrenheit. The air, after passing through the water, is expanded 100 per cent., thus producing a motive power with an economy of 75 per cent. over that of steam.

THE Central Pacific shops in Sacramento, Cal., are building seven new locomotives for use on the heavy local trains which run between Oakland wharf, Oakland, Alameda and Berkeley. They are double-ender tank engines, with six 50-in. drivers and a two-wheeled truck at each end. They have side tanks and a long coal-box back of the fire-box, the tank being carried back to the end of the frame.

MR. W. W. OSBORNE, of Kansas City, is the inventor of an improvement on the snow plows in use at present. It consists in covering the surface of the plow which comes in contact with the snow with a casing of boiler iron. On this is laid a steam coil, covering the entire surface, the pipes being laid horizontally and securely fastened. They are then covered with a casing of sheet iron, which forms an air space around the pipes. Boilers and water tanks are placed inside the plow, or it may be attached to the engine boiler, and the steam coil is connected with the steam space of the boilers. The surface of the plow can thus be heated to a temperature of 400 degrees by carrying the necessary pressure of steam in the boilers (240 pounds). This will melt the snow very rapidly as the plow is driven into it, and what is not melted will compact together and, sliding from the hot sloping surface of the plow, will remain in a compact mass clear of the track.

THE Baltimore & Ohio Railroad Company's annual report, for the year ending Sept. 30, 1881, states that the revenues of all the lines were $18,463,877; net earnings, $7,073,398. The gain in passenger earnings is $334,932, and in gross earnings $146,137 over last year. The increase in profit and loss account is $1,697,038, and the surplus fund, which represents invested capital derived from net earnings, and which is not represented by other stock or bonds, now amounts to $42,258,680.61. The low rates from trunk-line competition have had the effect of producing a comparative decrease in net results of $659,946, in the face of a largely increased business. The exceptional and highly conservative system of the company, by which more than $42,000,000 of net earnings, unrepresented by stocks or bonds, have been invested during a long series of years in great and valuable improvements and extensions, in connecting lines, in the great iron bridges over the Ohio River, in elevators, wharves, piers, docks, terminal facilities, etc., has enabled the company to continue the payment of semi-annual dividends of five per cent. on its capital stock, which amounts to only $14,783,300, a sum so limited as to present a marked contrast to that of all competing trunk lines, the capital stock of the New York, Lake Erie & Western being $75,879,300; that of the New York Central & Hudson River $89,428,300, and that of the Pennsylvania Railroad, $68,870,200.

A MR. WILSON is experimenting on the Canada roads with a new combination freight car. Its capacity is 24 tons, and it is designed to carry grain, flour, lumber and general merchandise. The inventor claims that he has succeeded in carrying 24 tons of freight on two sets of four-wheel trucks. The ordinary freight car, he says, has a carrying capacity of 12 tons, or 400 bushels. This increased capacity of the combination car is obtained by a system of trussing or trellising. All the space, three feet above the center of the wheels and the axle, hitherto lost, is utilized by the attachment of two hoppers, each holding 150 bushels, thus giving an increased capacity of 300 bushels below the center of gravity, or the line where loading begins on the old system. By combining the upper floor with the main frame of the car, additional strength is secured with the increase of carrying space. The next claim for superior construction is in the increased facility for discharging grain. A combination car can be unloaded in 40 seconds by a regulating slide. In the ordinary way it takes four men 20 minutes. It is proposed by lining the new car with sheet iron, to use the same for coal and wheat at pleasure. The cost of the new car is $900, weight 27,650, against a cost of $600 for the ordinary freight car, weighing 22,000 pounds. With 10 cars to the train, against 12 of the latter, it is estimated that the new car will do twice the work of a much more varied character at two-thirds the cost of construction and running.

THE shops of the Marquette, Houghton & Ontonagon R. R., at Marquette, Mich., are a surprise to most railroad men who visit them, on account of their magnitude and complete equipment of tools and machinery. The road is only 63 miles in length. The shops were built in 1870. The car shop is of brick, 65 × 275 ft., with a pattern shop 25 × 65 at the end. The pattern storehouse is a wooden building 30 × 60 ft., and the paint shop is also of wood. The machine shop, 52 × 118, blacksmith shop 52 × 72, and round-house of 16 stalls, one of stone, the three being joined together so that the round-house turn-table serves all. At the end of these is a brass foundry 66 × 52. The boiler shop is 25 × 60, and storehouse 24 × 75. The car equipment of the road consists of 10 passenger and baggage cars, 30 box, 93 platform, and 1,980 ore cars, 2,113 in all. With the exception of 200 ore cars, they were all built at these shops. During the ore season, which lasts while navigation is open, an average of 30 cars a day are repaired. During the winter 20 flat cars will be built for the coal traffic, and from 100 to 200 ore cars. The road has 30 locomotives, including five ten-wheel and three moguls. The latter are preferred on account of the grades, which are over 100 feet to the mile. Two more moguls are being built, with cylinders 18 × 24, drivers 54 in., and weighing 50 tons in working order. The road is also getting three switching engines with six drivers, independent tanks, and no trucks. Two of them will have 17 × 24 cylinders, and the other 14 × 22.

THE new Broad street station of the Pennsylvania R. R., in Philadelphia, is completed. The lower story is built of massive blocks of rough-dressed Fox Island granite, with an open arcade upon the Merrick street front, supported on polished granite columns. The main floor of the building is on a level with the elevated track, and the walls above the granite base are built entirely of smooth pressed brick and terra-cotta. The clock tower at the northeast angle rises to a height of 176 ft. The space below set aside for the carriage-ways is flanked on the Filbert street side by the main entrance to the station, and on the Market street side by the main exit. Elevators will carry the passengers to the second floor. The space fronting on Merrick street is divided into two large rooms, that on the north side being the waiting-room and that on the south a dining-room. Dressing-rooms, bath-rooms and a barber shop are also provided. The kitchen, pantries and store-rooms are on the third floor. The rooms on the fourth floor are occupied entirely by officers of the railroad company. The interior decorations of the building are very lavish. The floors are of marble, and the furniture of oak and ash, heavily carved in Gothic designs. The rear of the building joins the train platform, upon which the doors of the main waiting-room open. The ground floor under the tracks, which is supported on iron girders and columns, is devoted entirely to receiving and discharging freight. Only the best material has been used, and as the buildings are almost entirely composed of stone, brick and iron, they are considered practically fire-proof.

THE E. D. ALBRO COMPANY, of Cincinnati, are the most extensive dealers in hard-wood lumber in the country. Their supplies are drawn from the extensive timber regions of the Southern States, Mexico and Central America, and also from the old world. In their yards and factory, where the lumber is seasoned, dried and manufactured, may be found every variety of cabinet woods, including the best mahogany and Spanish cedar, Circassian, French and American walnuts, Hungarian ash, ebony, thuya, amboine, amaranth, rosewood, white holly, satin-wood, California redwood, bird's-eye maple and the richest tulip wood. The veneers from the French walnut burl are among the wonders of the art. The designs woven by nature into the fiber of the curved and knotted growths are brought out in all their delicacy by the perfection to which veneering has been carried. The manufacture of veneers from these burls is a specialty with this company, and in it they are without a rival in Europe or America. The company have special facilities for ocean and land transportation, and are connected with the Tennessee Lumber Company, an outgrowth of the enterprise of the Albro Company. Extensive mills are in operation on the Tennessee River, and others are in course of construction for the conversion into lumber of the heavy forest timber of East Tennessee. The region drained by this river and its tributaries is the richest in valuable timber of any in the world, and practically inexhaustible for generations. The company also own all the fine walnut timber in an extensive area in Kentucky, and intend to rapidly increase their transactions in both regions. Another feature of their business is the exportation in large quantities of our native hard woods, the demand for which is increasing in foreign markets.

MR. MICHAEL B. O'NEILL, of Halifax, N. S., has patented an improved ash pan for locomotives. The bottom of the ash box is formed of a series of end-pivoted pans, preferably of semicircular form in their transverse section, and with overlapping flanges on their upper edges. These pans are connected at one of their ends with a bar which has an attached crank movement that is operated by a rod from the cab, for the purpose of turning and dumping the pans and of returning them again to their receiving position. A perforated pipe connected with the water tank, and provided with a cock, passes over the pans for wetting down the ashes before emptying them. By this construction the ashes can be emptied at any time or place. They will not set fire to bridges or sleepers, and being frequently emptied, will serve as ballast and prevent growth of grass. The readiness with which the ashes may be cleaned out while the locomotive is in motion is of great advantage. An increased draught results from the ash box being emptied frequently, thus saving labor and fuel.

MR. NELSON G. NORTHUP, of Eaton Rapids, Mich., has patented a simple but improved extension step for cars. The object of this invention is to provide a convenient device whereby the steps of cars may be quickly lengthened and shortened. It consists of a step secured to and combined with the ordinary car steps, and made vertically adjustable for the purpose of extending the steps downward to any desired point, and thus affording an auxiliary step under the lower fixed step of the car. This auxiliary step may be raised or lowered by means of hangers arranged to slide up and down within tubular guides on the outer faces of the sides of the regular steps, said hangers being formed with racks, with which pinions on a cross shaft operated by a handle or crank are made to engage.

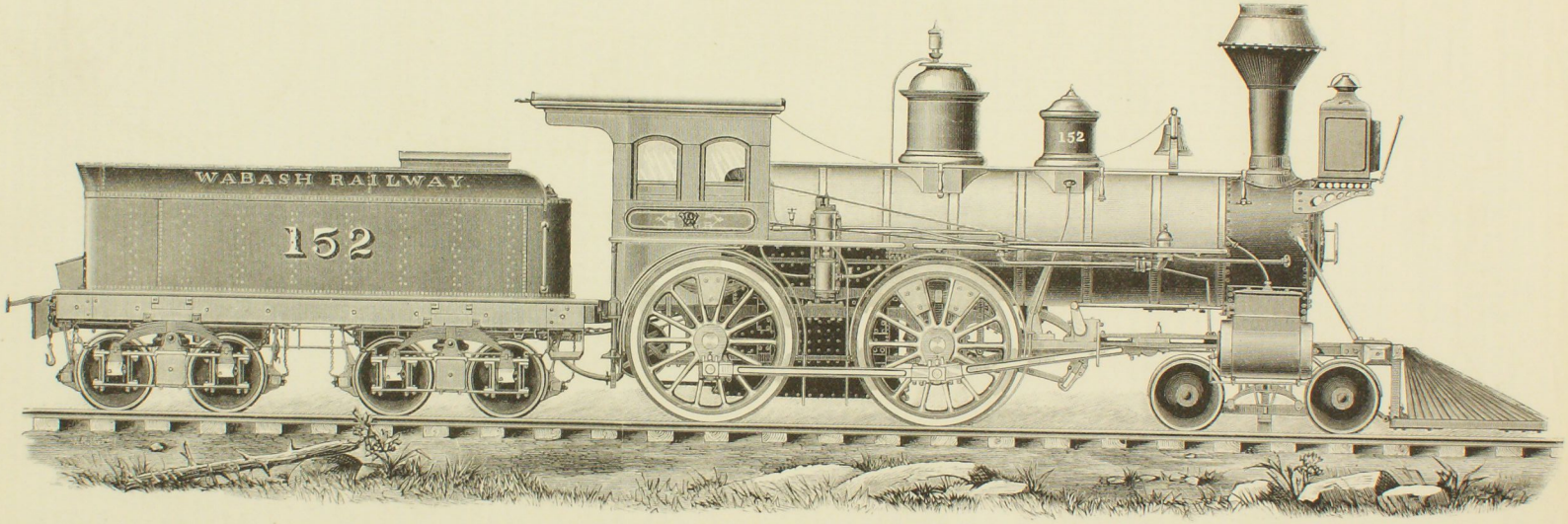
The First Passenger Train.

A correspondent of the *Industrial World* (Mr. James Wood, of Vinton, Ia.) claims to have been an eye-witness of the first passenger train moved by a locomotive. It was at Darlington, England, in 1826. The line was used mostly for carrying coal, and the cars were drawn by horses; but on the occasion referred to three or four coaches were fastened together and drawn by one engine. These coaches are described as an enlarged pattern of the English stage coach, with two compartments inside, generally occupied by ladies. On the outside, on top of the coach, were several seats at right angles with the track, ranging downwards from the center each way, each seat accommodating from six to eight passengers. Inside and out there were some 60 to 80 passengers, and the whole drawn by a single horse frequently, but sometimes two horses were employed. The driver sat sometimes on one of the passenger seats, but on some coaches there was a small seat in front on purpose for his use. There was a conductor clad in a red coat who was called the guard, who with his trumpet would herald the coming of the coach and collect the fares.

"All the town," says Mr. Wood, "was out to see the train when it came. The depot was on a piece of rising ground. The train at last came in sight and stopped at the depot over an hour, and I got down from my father's shoulder, and after a good deal of squeezing and jamming managed to get alongside the engine. A begrimed looking man was explaining the machinery to several gentlemen of the town, and I frequently heard him addressed as Mr. Stephenson by different ones asking information about the machine. An older brother was with me and he attended the grammar school there, and the principal, Rev. Mr. Clemanson, said to my brother and me: 'This train is the first passenger train in the world ever drawn by an engine, and the man you saw explaining to us the principle of the working of the engine is George Stephenson. If this experiment is a success his name will become known the world over.' The engine was a black looking affair, with rods and cams and cross beams that flew up and down with a clattering noise. The engineer had no cab or covering of any kind over his head. I do not recollect anything further than that the wheels of the engine were about the size of our ordinary car wheels."

A Magnificent Official Car.

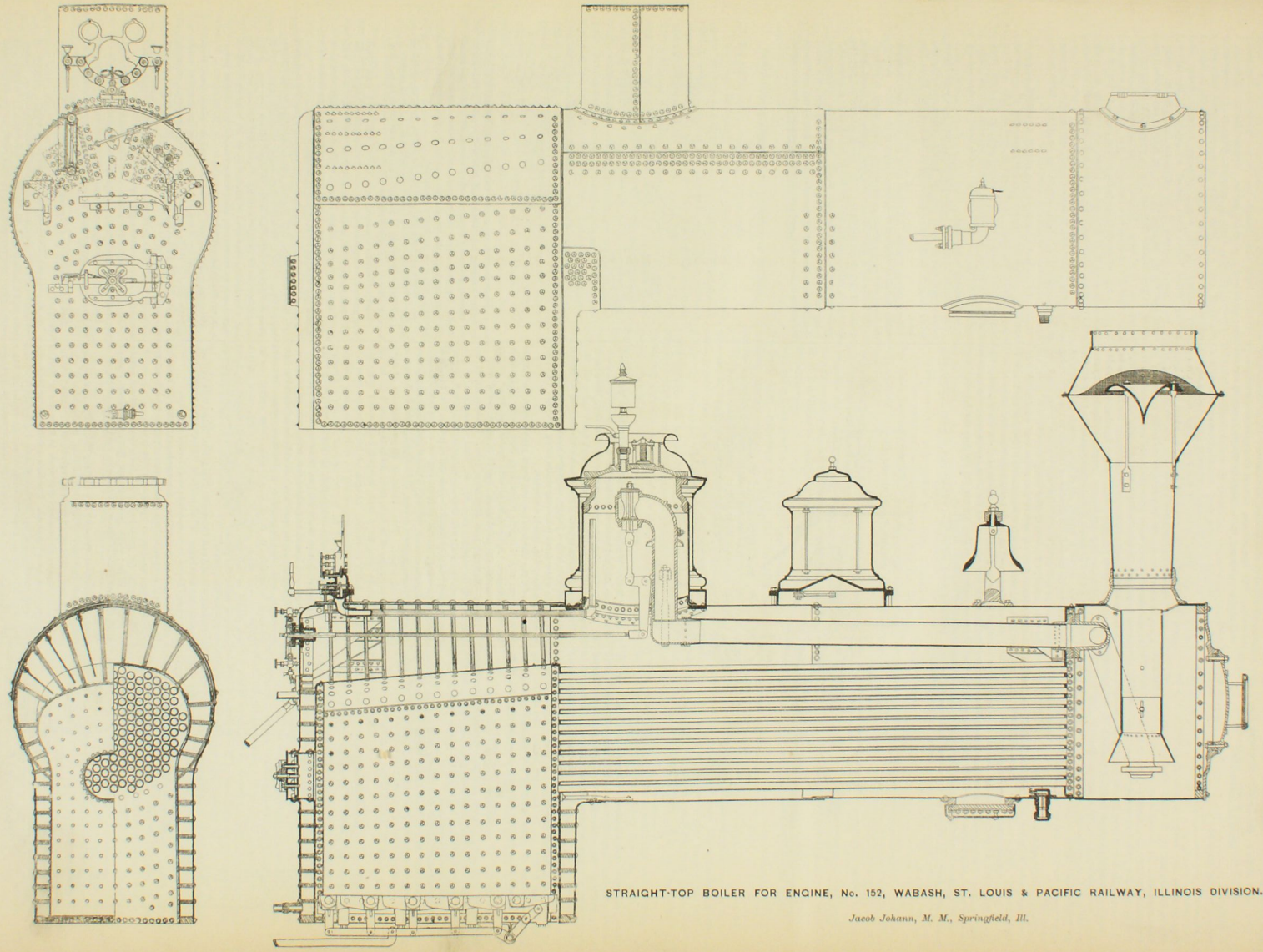
The Detroit *Free Press* prints a lengthy description of a new official car just completed at the Pullman works in Detroit, for Mr. Henry Villard, President of the Oregon Railroad & Navigation Company. The car is said to be the most complete and magnificent of any in the world. It is 69 ft. 6 in. long over all, 9 ft. 10 in. wide, and from the track to the top of the roof is 13 ft. 4 in. in height. The trucks, wheels, air brakes and couplings are of the most approved patterns and of perfect construction. The air for ventilation is admitted through silver-plated gauze netting in the hoods over the platforms, constructed with a special view to the exclusion of dust and cinders. In its arrangement it does not differ from the ordinary Pullman car, but in elegance of finish it has never been equaled. The wood work is finished in massive raised panels, and the central panels of the berth fronts are exquisitely carved. The door is a mirror, and the compartment is separated from the drawing-room by curtains, which are looped back during the day, thus throwing the two compartments into one. From the central panel is suspended a four-light gold-plated lamp, which is a *fac simile* of the two in the drawing-room. The drawing-room is a marvel of elegance and elaborate ornamentation, and so complete is the general effect that it is almost impossible to notice the details. Standing in the berth section, one sees facing him a large beveled-edge plate mirror, finished at either end by smaller mirrors, also of heavy-beveled glass, the joints being masked by a narrow gold molding; above it is a cornice finished with a beautiful rosewood railing to match the book shelves, placed on either side of the mirror, and with it, extending the entire width of the car, except the narrow space reserved for a passage to the state-room and observation-room. Below this mirror is a sofa, which at night becomes a double bed. There is also a state-room, 7 ft. square; a toilet-room, and an observation-room, as wide as the car, and 7 ft. 6 in. in length. It is a strong contrast to every other portion of the car, and its finish is a novel experiment in this kind of work. All precedents in regard to color and woods have been disregarded, and the result is as pleasing as it is novel. The oak of which it is constructed is stained to the color of the Irish "bog oak," and the grain being the same, the imitation is perfect. The panels are of the same heavy raised pattern used in the other portions of the car, and are copied from those in some old English houses; but the long ones are relieved and thrown into prominence by narrow gold moldings marking the joints.



PASSENGER LOCOMOTIVE (No. 152) WABASH, ST. LOUIS & PACIFIC RAILWAY.

Built at Springfield (Ill.) Shops—Jacob Johann, Master Mechanic.

(For specifications, see page 6.)



STRAIGHT-TOP BOILER FOR ENGINE, No. 152, WABASH, ST. LOUIS & PACIFIC RAILWAY, ILLINOIS DIVISION.

Jacob Johann, M. M., Springfield, Ill.

Specifications for Locomotive (152) Wabash, St. Louis & Pacific Railway.

GENERAL DIMENSIONS.

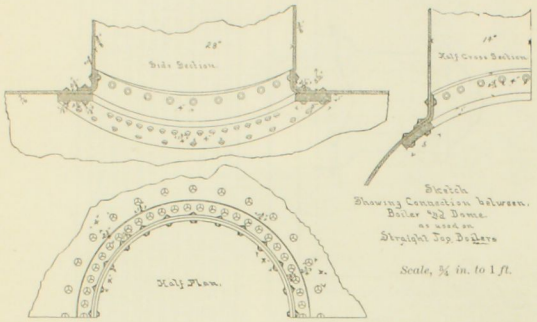
Cylinders	17 x 24 in.
Driving Wheels, diameter	5 ft. 9½ "
Inlet ports	1¾ x 12¾ "
Steam ports	1¾ x 16 "
Exhaust ports	3 x 16 "
Width of bridges	1¾ "
Tank capacity	3,000 gall.
Weight on drivers	51,000 lbs.
Weight of engine with 3 gauges of water	80,000 "

Boiler and fire-box of steel, flues of iron. Fuel, soft coal.

Boiler.—Straight top; and made throughout of best homogeneous steel plates $\frac{7}{16}$ in. thick (unless otherwise specified) and riveted with ⅞ in. rivets, spaced not over 1¾ in. between centers. All longitudinal seams double riveted and welted, all circular seams single riveted and welted around the bottom to above water line.

Pressure.—150 pounds to square inch.

Waist.—Inside diameter at smoke-box end 52 in., and at fire-box end 53⅜ in. Side sheets of fire-box shell ⅝ in. in thickness, and extending to the top, forming a butt joint at the crown, and over these an extra crown sheet ⅜ of an inch in thickness is placed, extending down far enough on each side to receive all the fire-box crown stays. This extra crown sheet is riveted to the side sheets on each side of the butt joint formed by them at the crown, and near the lower



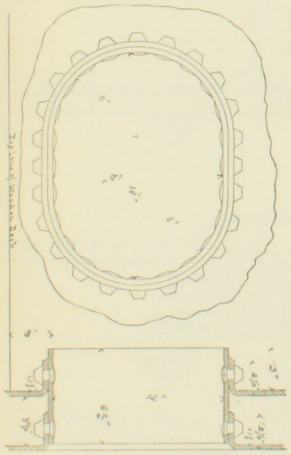
Scale, ¾ in. to 1 ft.

edges of this extra sheet. Dome 28 in. in diameter inside, and 28 in. high above boiler, fitted with cast-iron ring and cover so arranged with slotted flanges that bolts may be used instead of studs. Center line of dome situated 7 ft. 7 in. ahead of the back face of back head of boiler, the placing of the dome so far ahead being necessitated by the system of staying employed.

Smoke-Box is 52⅜ in. in diameter inside, and 33 in. long from center line of rivets securing the junction between the smoke-box and waist and the front end. Length over all, 20 ft. 6 in.

Tubes.—Of No. 11 lap-welded charcoal iron, with copper ferrules at both ends. Tubes, 160 in number, 2 in. outside diameter—11 ft. 6 in. long, separated by ⅝-in. bridges in fire-box flue sheet, and ⅝-in. bridges in front of flue sheet, to provide for a more perfect water circulation.

Fire-box.—Of steel, arched and sloping, with round corners, box 66 in. long and 34⅝ in. wide inside, height (sloping 1 in. to the foot) 70 in. in front, 64½ in. back, inside measure. All plates



Scale, 1½ in. to 1 ft.

thoroughly annealed after flanging. Flue sheet ½ in., crown sheet ⅝ in., side and fire door sheets $\frac{7}{16}$ in. thick. Water spaces 3⅜ in. all around at the mud ring, increasing to 4 in. near the crown sheet, this increase being made by closing in the side and fire door sheets for the sides and back, and by setting out the throat sheet for the front. Stay bolts are ⅝ in. in diameter; screwed in and riveted to sheets and not over 4½ in. from center to center. Fire door opening formed by a special oval ring riveted to the outside and inside sheets by flanging both sheets outward.

Crown Staying.—Crown sheet arched transversely with a radius of 35 inches, with round corners of 13-in. radius at flue sheet end, and 10-in. radius at fire-door sheet end. Crown stays of 1-in. Sligo iron upset at one end to admit of an ⅝-in. thread; spaced longitudinally 4⅜ in. and transversely 5½ in. apart on crown sheet. The stay holes in the boiler crown are so located that the stays enter both the inside and outside crowns at the same angle longitudinally. The obliquity at which they enter the outside crown transversely, especially the lower rows, being compensated for by the double sheets forming the outside crown. Even the stay having the greatest obliquity is by this means provided with ample thread connection in the boiler crown. The fire-box crown is tapped out to 1-in. thread, and the boiler crown to 1⅛-in. thread, the number of threads to the inch being the same in each case, special taps and reamers being employed for the purpose. The stays, after being screwed into place, are cut off within $\frac{3}{32}$ of an inch of the inside and outside crowns, and riveted over with a few well-directed blows of the hammer.

Boiler Staying.—The back head and front flue sheet is well stayed by angle gusset braces made of $\frac{7}{16}$-in. steel plates, the double angle iron connections for these braces also being made of the same material, as they answer the purpose much better than if made of merchant angle iron.

Cleaning Arrangements.—Cylinder part of boiler is fitted with Johann's Boiler Washer immediately back of front flue sheet, with a man-hole just back of washer for convenience in examining boiler. Cleaning plugs in corner of fire box. Hand-hole plates in front leg, and blow-off cock in back end.

Throttle.—Balance poppet throttle valve of cast iron. Throttle pipe of cast-iron with a flange or water-shed cast on with it, to prevent the water from following steam along the pipe. Dry pipe of wrought iron, 6 in. inside diameter.

Grates.—Of the cast-iron rocking finger grate pattern arranged to work from cab. Fingers 9¼ in. long from center of grate to the end of fingers. Ash pan fitted with double dampers.

Smoke Stack.—Diamond shape; top 15 ft. above top of rail.

Frames.—Material, best hammered iron. Dimensions, 51 in. from outside to outside; bars 3½ in. wide throughout, 4½ in. deep between pedestal, 8 ft. between pedestal centers, 3 ft. 4½ in. from center of back pedestal to back end of frame, 4 ft. 1 in. from center of forward pedestal to front end of connection. Length of pedestal limbs over all, 23½ in.; pedestal limbs secured together by wrought-iron pedestal braces, 2½ x 3½ in., securely bolted to lower bar of frame. Front limbs of all pedestals are at right angles to center line of motion, back limbs tapering 1 in. to the foot—all limbs being fitted with flanged wedges and shoes, the back ones being movable. Length of back frames over all, 15 ft. 5½ in. Forward frames, 3½ in. wide 4 in. deep; length of forward frames, 14 ft. 2½ in. over all; length of forward and back frames after connection is made, 26 ft. 4½ in. Top of forward frames to set 12½ in. below top of back frames.

Cylinders.—Of best close grained cast iron, one cylinder and half saddle being cast in one piece. Right and left cylinders are reversible and interchangeable. Distance from center to center of cylinders, 6 ft. 2 in.; valve faces raised 1 in. above steam chest seat to allow for wear. Oil valves are placed in cab and connected to steam chests by pipes running under the jacket. Pipes of seamless brass tubing, proved to 200 pounds pressure.

Pistons.—Heads and followers of cast iron, fitted with self-adjusting cast-iron rings. Piston rods of steel 2⅜ in. in diameter, ground and keyed to cross-heads and riveted to piston.

Guides.—Of wrought iron, case-hardened, securely fitted at back ends to a wrought-iron guide-yoke which is 1 by 8 in. between frames, and has no connection with boiler.

Cross-heads.—Of cast steel, with Babbitted bearings; length of bearing, 16 in.; wrist pins separate from cross-head, and of steel, and are pressed into position, being held from turning by a feather.

Link Motion.—Is the ordinary shifting link. The link blocks, saddles and pins are of hammered iron, case-hardened steel bushings being used on all parts of valve motion where it is possible to do so, and all bearings that work in them are of steel or wrought iron, case hardened. The link is solid, 23 in. long over all; block opening 2¼ in.; section of link, 1¼ by 2¼ in. wide; radius of link, 60 in.; distance from center to center of blade pins, 13 in.; center of saddle pin is on link arc and 3 in. above horizontal center of link. Link block bearing, 5⅛ in. long, with wide flanges to give increased wearing surface. Length of hanger from center to center, 10 in.; length of lifting arm, 21⅞ in. Rocker shaft of cast steel, bearing being 4 in. in diameter by 10⅝ in. in length. Lower arm 10 in. and upper arm 10⅛ in. long from center to center. Reversing shaft of wrought iron with arms forged on.

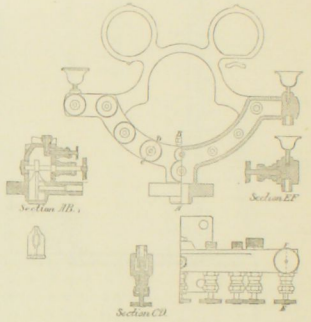
Valves.—Plain slide; outside lap, ⅞ in.; inside lap, line and line; valve lead $\frac{1}{16}$ in. at full stroke. Greatest travel, 5¼ in.

Driving Wheels.—Four in number, 69½ in. in diameter; centers of cast iron with hollow rims, spokes and hubs, and turned to 62½ in. in diameter to receive tire. Tire, 3½ in. thick, when finished 5⅛ in. wide. Distance between inside of driving wheel hubs when placed on axles 54¼ in. Axles of cast steel; journals 7 in. diameter and 8 in. long; wheel seat, 6½ in. diameter by 7 in. in length; eccentrics, 5 in. throw, 14⅝ in. outside diameter, 3¼ in. wide, with a tongue 2½ in. wide and ⅝ in. deep. Eccentric straps of cast-iron, parting at an angle of 45 degrees to a horizontal line, provided with an oil cup on top and an oil cellar in the bottom; space for eccentric blade planed out to receive end of blade, which is 3½ in. wide and 1 in. thick. Driving boxes of cast iron, with brass bearings Babbitted; saddle of cast-steel and separate from boxes. Driving springs of best cast-steel, tempered in oil; springs 36 in. long over all, and composed of 8 ½ in. leaves, 3½ in. wide. Steel roller connection between saddle and spring band.

Rods.—Of the best hammered iron and of I. section between stub ends, planed throughout and furnished with all necessary straps, keys and brasses. Main rod 7 ft. 6½ in. long between centers; front bearing 3 in. in diameter and 3 in. in length. Back bearing, 4 x 8⅝ in.; side rods, 8 ft. long between centers; bearings, 3 in. in diameter 8¼ in. long; crank pins, of cast steel 4¼ in. in diameter in hub seat.

Feed Water.—Supplied by two No. 16½ Rue injectors placed inside of cab, one on each side of boiler, water entering the boiler through check valves placed 22 in. back of the front flue sheet.

Steam Gauge Stand.—All steam used for the various purposes on the engine is obtained from one opening in the boiler through the intervention of a steam gauge stand. This stand is secured to the boiler by a heavy flange and four studs, the stand being weakened just above the flange. The steam is admitted into the stand by a valve opening into the boiler, which valve is controlled by an eccentric wheel above the flange, the whole arrangement being such that if in case of an accident of any kind the stand should become knocked off, the valve would close by the pressure of the steam in the boiler, and preventing its escape, give the engine



crew almost absolute immunity from scalding. Steam is supplied by a pipe running into dome from its interior, and is supplied to the various points by means of small valves, all within the stand itself. The only other openings into the boiler, within the cab, are those made for the water glass and for the gauge cocks; these however, are more perfectly protected.

Cab.—Made of hard wood, with an extra outside lining of poplar. Front fitted with heavy sheet-iron boiler head plates.

Pilot.—Of oak, 35 in. in height, with up and down slats. Bottom of pilot 3½ in. above top of rail.

Finish.—Cylinders lagged with wood, and cased with sheet iron painted. Head casings of cast iron painted. Steam chest with cast-iron covers, bodies lagged with wood and cased with sheet iron painted. Dome lagged with wood, with sheet-iron casing painted. Boiler lagged with wood and jacketed with Russia iron secured by Russia iron bands.

Furniture.—Engine furnished with sand-box bracket and shelf to receive head-light, bell, whistle, two Richardson safety valves, one set to blow off at 5-in. pressure higher than the other, water glass and gauge cocks, cab lamp, oil cans, tallow pot, etc. Also, a complete set of tools, consisting of two jack-screws, one pinch bar, a complete set of steel wrenches to fit all bolts and nuts on engine, one screw wrench, hard and soft hammers, chisels, poker, scraper, shake bar, slice bar, etc.

Painting.—Engine and tender painted in plain dead black color, with the name of railway painted on collar board of tank, and the number of the engine on a front plate in front of smoke box; also on each side of sand box, and in large figures on each side and rear of tank.

Gauges.—All principal parts of engine are fitted to gauges and templates, and are thoroughly interchangeable.

Case Hardening.—All movable bolts and nuts, and all wearing surfaces made of steel or iron are case hardened.

Alloys.—All wearing brasses made of ingot copper and tin are alloyed in the proportion of seven parts of copper to one of tin.

Threads.—All bolts and screw-threads are of the United States standard.

Engine Truck.—Four-wheeled center bearing; spread of wheels, 5 ft. 6 in.; outside to outside of frame-bars, 47 in.; frame bars held together by a combined cast-iron deck or bolster and center plate; center bearing 16 in. diameter; deck well strengthened with ribs, planed, fitted and bolted to upper frame by 16 1-in. bolts; deck also provided with two wrought-iron 2½ x ⅝ in. safety truss-bars, the ends being bolted to the upper frame-bars for the purpose of supporting deck in case of breakage.

Frame-bars.—Upper frame-bars 94¼ in. long, 4 in. wide and

1⅜ in. thick; lower frame-bars 85½ in. long, 4 in. wide and ¾ in. thick. Top bars planed on sides and edges to insure straight lines.

Pedestals.—Of cast iron, 14 in. long, 4 in. wide and 1⅛ in. thick, each being bolted to upper frame-bars by two 1-in. bolts, and to lower frame-bars by one 1-in. bolt, the lower frame-bars having lips forged on to aid in securing pedestals. Sides and faces, also tops and bottoms of pedestals, are planed and spaced 9 in. apart between faces.

Shoes.—Pedestals supplied with cast-iron shoes, planed on all sides, 14 in. long and 5 in. wide on wearing face, and ⅝ in. thick, with flanges ½ in. thick and 1⅝ in. deep.

Cross-bars.—Two cross-bars 3 in. wide and ⅞ in. thick, bolted to ends of upper frame-bars.

Springs.—Four springs of cast steel, two on each side, with six ½-in. leaves, 33⅜ in. long over all, springs bearing on top in a cast-iron saddle; underneath the upper frame-bars, and on each end, in a cast-iron shoe, secured on the equalizing bars.

Equalizing Bars.—Of wrought iron, four in number, two on each side, 4 in. wide and 1 in. thick; the ends of the bars resting on top of boxes.

Boxes.—Of cast iron, with solid brasses 1½ in. thick through crown of brass. Boxes have wearing surface on each side 9 in. long by 5 in. wide. Cellars fitted to boxes by means of a wedge-shaped projection, having a slant of 1 inch in 9 inches, and held in place by a ¾-in. key bolt, passing through corresponding lugs on box and cellar.

Axles.—Of steel, 67⅝ in. long over all. Wheel seat, 4¾ in. in diameter, 7¼ in. long; length inside wheel seats, 52½ in.; journals inside bearing, 5 in. in diameter, 9 in. long. Diameter of axle at center, 4¾ in.

Wheels.—Chilled, double plate, 30 in. in diameter.

Collars.—Axles supplied with cast-iron collars just inside of boxes.

Safety chains.—Truck supplied with two safety chains, secured to front ends of upper frame-bars.

Wheel covers.—Of sheet iron, fastened to truck frame.

[Specifications for Tender and drawings of Tender and Engine Truck will be given in next issue.]

Communication.

Sedimentary Deposits in Locomotive Boilers.

To the Editor of the National Car-Builder:

Every one in charge of locomotive boilers has been more or less troubled by heavy deposits of sediment, which, despite frequent washings-out, will within a short time completely fill the space between the crown-bars, and also a large portion of the space between the flues. This sediment, becoming backed or hardened by continuous contact with the heated surface of the fire-box and flues, materially diminishes the effective heating surface, and at the same time, by preventing the protective action of the water on these heating surfaces, is very apt to lead to mud-burning and other disastrous disturbances of the material of which the boiler is composed. This sediment, after becoming hardened or baked, can only be removed by the vigorous use of hammer and chisel in the case of crown-sheets, and by removing and rolling in the case of flues.

It might be suggested that the proper way to remedy this evil would be to purify the water by extracting the sedimentary element before it is admitted to the boiler. For obvious reasons, however, this so far has not been done in a satisfactory manner in the case of locomotive boilers, and probably cannot be done without an outlay of time and money that would not be warranted by the results obtained. It therefore becomes necessary to reduce the effects of these deposits to a minimum by mechanical contrivances in the structure of the boiler itself, tending towards a removal of the sediment before it becomes hardened, and by the easiest and simplest methods.

The rapid sediment-forming qualities of our Western waters render it absolutely necessary that some steps should be taken in this direction in order to obtain from boilers the most effective work consistent with safety, and with the smallest expenditure of labor and money. The first step would seem to be to lessen the liability of sediment lodging on the crown-sheet and remaining long enough to become baked and converted into scale. This in a great measure can be accomplished by arching and sloping the fire-box crown-sheets as much as is permissible and by the use of long stays in place of the obstructive crown-bars. The reasons for these methods are quite obvious when it is considered that the liability of sedimentary deposit on the crown is very much less on a sloping and arching surface than on a horizontal one, this liability being diminished as the slope is increased and the radius of curvature decreased. This method of construction has, also, several other advantages, aside from its effects on deposits. The arching of the crown-sheet would undoubtedly aid in supporting the crown, and perceptibly diminish the amount of external staying required to keep it in position. As a result of arching and sloping it would be necessary to set the lowest gauge-cock above the highest point of the crown, thereby avoiding any possible chance of the sheet becoming uncovered while ascending or descending heavy grades, or while rounding sharp curves, as long as the boiler contains one gauge of water on a level. With the straight crown many know to their cost that such danger has manifested itself by burnt sheets. The sloping also brings the crown nearer the fire at a point where the fire acts less on it, and at the same time does not diminish the available space for flues.

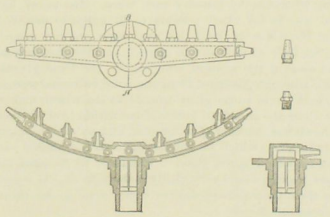
In behalf of long stays it may be said that the use of crown-bars, with their accompanying bolts and washers, causes a considerable portion of the crown to be worthless as a heating surface, and at the same time furnishes a most ready means for the lodgment of sediment; with the still further disadvantage of rendering the surface almost inaccessible for the purpose of scraping and cleaning. By using long stays it is obvious that the liability of the deposit lodging on the crown would be diminished in a great degree and an almost perfectly open crown-sheet secured, which could be easily got at for cleansing and washing.

The use of long stays, however, would necessitate the placing of the dome further forward on the boiler than usual, but which would prove to be an advantage rather than a detriment, for the following reasons: It is nearer the center of longitudinal oscillation of the boiler, and consequently there would be less agitation of the water at that point, and less liability to "swashing and priming." It also places the dome more nearly over the center of the most active steam-generating surface, and by using a large dome and dome-ring opening, so arranged that bolts instead of studs could be used in securing the cover to the dome, a boy can be let down at any time with hose and scraper to remove any scale that might have accumulated, without disturbing the throttle pipe.

Having made provision for keeping the crown-sheet as clear as possible, the prevention of sediment in the barrel or waist of the boiler next requires attention. The first step in this direction is to space the flues further apart, and use a less number in proportion to the size of the boiler than formerly, thereby securing a more perfect water circulation and an increased reserve of heated water.

The boiler of engine No. 152, designed and built by Jacob Johann, the master mechanic of the Illinois Division of the Wabash, St. Louis & Pacific Railway (see illustrations in current number of CAR-BUILDER) is a practical embodiment of the theories advanced, and has proved to be a practical success.

In keeping the barrel of the boiler free from sediment we have been materially aided by the use of a boiler-washing device, which is a modification of one in use for a similar purpose on the Illinois Central Railway (see October CAR-BUILDER). The application of this device may be briefly described as follows: A hollow brass casting, with two horns or projections, curved to closely follow the curvature of the boiler, and provided with small nozzles projecting horizontally and vertically, is placed in the bottom of the boiler just back of the front flue-sheet, with the openings of the horizontal nozzles directed toward the fire-box, and the vertical nozzles directed up through the vertical clearances between the flues. A third projection, provided with a flange and a valve opening inwardly, is put through a hole in the bottom of the boiler, and by means of riveting and caulking the flange to the boiler the washer is secured in position. The construction is shown in the cuts.



Section A B.

When using the washer the hose from the force-pump is connected to the part extending through the bottom of boiler, the blow-off cock opened and the water forced in after the pressure has fallen to 50 or 60 pounds, in order to prevent the damaging effects of a too sudden cooling of the boiler. After the boiler has cooled sufficiently, the water is shut off and it is allowed to empty itself. Water is then again forced in, when the forcible jets break up and drive the sediment into the leg, from whence it can be readily removed. The blow-off cock is then closed, and the boiler filled through the washer before disconnecting the hose.

The use of this washer, by preventing the formation of a foundation for sediment, causes almost absolute freedom from its creeping up between the flues. The first one put in use, after having been in operation for over 20 months, was found to have performed its work so thoroughly that the bottom of the boiler in which it was placed was perfectly clear, and the flues in reasonably fair condition. Without this device we would have been compelled to remove the flues at least within twelve months after having been put in.

To test the practicability of using long stays, and as a means of diminishing the chances of sedimental deposit on the crown, a straight boiler was constructed at the Springfield shops in January, 1879, for a 15 x 22 cylinder engine, with an inside diameter of 46½ in. at smallest ring, the fire-box dimensions being as follows: Length, 67¼ in.; height, sloping from 62 in. in front to 57 in. at back; width at bottom 34¼ in., at top 39¼ in.; the crown sheet arched with a radius of 35½ in., having round corners with a radius of 10 in. From May, 1879, to Feb., 1881, both inclusive, this engine made a mileage as follows:

	Miles.
Passenger service	79,570
Freight and other service	4,500
Total mileage	84,070

During all this period, neither the flues nor stays gave any trouble or exhibited any signs of leaking, and upon examination the crown stays were found to be all sound, and the crown sheet clear of sediment. The boiler was then closed without disturbing any of the stays, and they are still in good condition.

The success of this boiler led to the building of another on a large scale during the summer of 1879. This boiler was used in a new 17 x 24 cylinder engine, No. 152, and is of the following dimensions:

Inside diameter, smallest ring	52 in.
Length of fire-box	66 "
Width " "	34⅝ "
Height " " " front (sloping)	70 "
" " " back	64¼ "
Slope at rate of 1 in. to 1 ft.; round corners, 13 in. radius at flue sheet end, and 10 in. at fire-door sheet end	
Flues (2 in. outside diameter, 11 ft. 6 in. long)	160 "
Heating surface in fire-box above grate, minus sectional area through flues	99.5 sq. ft.
Heating surface in flues, outside diameter	993.4 " "
" " " " inside "	843.3 " "
Total heating surface, using external flue surface	1,092.9 " "
" " " internal " "	942.8 " "
Fire grate area	15.6 " "
" " " openings	5.63 " "
Ratio of grate area to total heating surface (external flue surface)	1 to 68.8 " "
Ratio of grate area to total heating surface (internal flue surface)	1 to 60.4 " "
Ratio of grate area to sectional area through flues	2.47 to 1 " "
Water capacity, with 2 gauges, or 5½ in. water above crown	1,150 gal.
" capacity in cubic ft.	153.3
Steam capacity under same conditions, cubic ft.	47.2
Total capacity	200.5

The engine having this boiler was turned out in Oct., 1879, and from that time until Sept., 1881, it made the following mileage:

	Miles.
Passenger service	82,451
Freight and other service	12,293
Total mileage	94,744

During this interval the boiler has regularly carried 150 pounds pressure per square inch, and has not required the expenditure of a dollar for repairs of any kind. It has been engaged in hauling our fastest and heaviest passenger trains, averaging from 10 to 12 cars, and is to-day in perfect condition.

As the summing up of the experience with these boilers, I will say that their working life has been undoubtedly prolonged by diminishing the destructive effects of sedimentary deposits through the intervention of mechanical contrivances in the structure of the boilers themselves. It is an open field for experiment, and well worthy of careful consideration and trial.

GEO. D. BROOKE.

Locomotive Shops, W., St. L. & P. Ry., Springfield, Ill.

Car-Builders' Monthly Meeting for December—Chilled Iron Car Wheels.

The regular monthly meeting was held at the Association Rooms, 113 Liberty street, on the 15th ult.

Mr. L. Garey, the President of the Association, announced that the subject for discussion was chilled iron car wheels—uniformity in their dimensions, coning, width of tread, and the proper weight of wheels for 20-ton cars. There were also many other things to be considered, and among them the pairing and fitting of both new and second-hand wheels.

Mr. F. D. Adams said that he found it very difficult to mate wheels that he got from Western cars, the sizes of 33-inch wheels made at different foundries varying from ½ to ¾ of an inch in diameter. He had found wheels on his own cars that other people had put on that varied ½ an inch. He supposed that this variation was partly due to the turning of the chills; that the makers, when they found a wheel that was not round, turned it out a quarter or half an inch, and consequently made it so much smaller. When a wheel could not be found to match, he always put on two new wheels, and if in such case he charged for the two wheels, there was complaint about it.

Mr. Garey had heard it stated that some wheel makers made their chills small in the first place so they could be turned out two or three times in case they got out of round. He was aware that the shrinkage of wheels would make quite a difference in size, irrespective of the size of the chill; but he had found wheels of the same man's make to vary 1½ inches in circumference. This could hardly be due to the turning of chills.

Mr. Adams callipered his wheels with a tape, and was governed entirely by the circumference at a certain point on the tread. If the circumference of two wheels was the same, they would move the same distance in revolving, and if not perfectly round, their working would not be materially interfered with. He had no great difficulty in matching the wheels of one maker, but there was trouble in matching those of two or three makers.

Mr. Garey had learned that it was the practice in some car shops to fit wheels according to certain marks put on them in the foundry, assuming that all of the same mark were of the same size. But he had found on examination that wheels of the same mark varied in some cases more than ½ an inch in their circumference. So far as this is

the case, should not the makers be responsible for the flanging and other troubles incident to mismated wheels?

Mr. Sweet, of Troy, N. Y., said he never turned up chills after they were once turned; and when they were so imperfect as to make a rough wheel, or if out of round, they were invariably broken up. He never marked wheels.

Mr. Snow, of the Ramapo Wheel Co., never turned a chill the second time. He had adopted a standard 30 years ago, and had ever since kept a certain diameter and circumference of wheel, so that a wheel made now would fit a wheel made 30 years ago. He marked his wheels with red paint that would not wash off, numbering them from 0 to 6. The measuring tapes were of brass and were divided into tenths of an inch, and this tenth would be the greatest variation in any wheel made. The chills were carefully examined once a year, and if any variation was detected they were broken up instead of being turned. He had long since been convinced of the fact that the thinner the chills are the more uniform would be their diameter under expansion and contraction from heat and cold, and that the thicker they are the more liable they are to become oval. If very thick, they become oval in a very short time from the contraction of the trunions of the chill. This was obviated by making the trunions hollow, and the chill very light. The wheels were measured about 2 inches from the outside of tread.

Mr. Sweet inquired whether, if the chill had become oblong the tape would indicate it in the measurement as quickly as to measure from the center.

Mr. Snow: Of course not. Measuring by circumference would not indicate the correctness of the chill at all. That we determine once a year, as I have said. All our chills are made of charcoal iron, the same as the wheels, the object of which is to prevent checking in the flanges, which would occur in a short time if made of soft iron.

Mr. Sweet said it had never occurred to him, until suggested by Mr. Garey, that chills were turned one or more times, until they were half an inch or an inch larger in diameter.

Mr. Adams said that such was the impression in the minds of nearly all car-builders, and he thought if all the wheel makers would make confession, it would be found that there were some grounds for the impresssion.

Mr. Scoville, of Buffalo, did not think there was a single wheel maker in the country that turned chills a second time. There was no saving in it, but, on the contrary, an absolute loss. He turned the wheel precisely 33 inches from the point of bearing, and the chill is tested twice a year with a ring of precisely the same size.

Mr. Blackall, of Albany, wanted to know where the point of bearing was from which the measure was taken.

Mr. Scoville: In turning ours they all turn from the steam templet, and this is 33 inches at the base of the flange.

Mr. Blackall: From this it appears that all the makers have different points to measure from.

Mr. Scoville: We have a 33-inch templet without regard to the size of the metal, which would vary from an eighth to a quarter of an inch.

Mr. Blackall alluded to the varying diameter of wheels with coned treads, and that the circumference would vary according to the place of measurement. He had wheels varying from 1⅞″ to 3 inches, but from different makers.

Mr. Adams thought it would be much better if the wheel makers would agree on some uniform point on the tread for measuring, and also on a uniform size, and all have a steel ring to test their chills with, and then the only variation would be from the shrinkage of the metal. There should also be a uniform width of tread. The Boston & Albany cars were almost excluded from the Pennsylvania road because the treads of the wheels of the former were not wide enough. They were, in fact, wide enough for any Northern road, but the Pennsylvania people were afraid of them and did not want them.

Mr. Snow thought the better way would be for the master car-builders to agree on a standard size, and provide the wheel fitters on every road with standard gauges to test the wheels, otherwise there would be confusion and trouble worse than now exist. He often had orders for different widths of tread—4⅛″ and 4¾″ inches—but his standards were 4 inches and 4¾″ inches.

Mr. Garey referred to the fact that in consequence of the immense interchange of cars, the wheels of four different makers were frequently found under the same car; so that the standard size of any one maker would not amount to uniformity except as the wheels might be used exclusively by one road. Some makers are very careful in marking their wheels, some are not so careful, and other do not mark them at all. These marks were the guides in many shops for fitting the wheels, and he thought it would be better for all concerned if manufacturers stopped marking wheels altogether, as to size.

Mr. Scoville objected to using a brass tape for determining the circumference, as its expansion and contraction caused it to vary several degrees. The temperature of the iron would cause a slight variation. A wheel with a large quantity of Lake Superior or sulphur iron would vary from 1/8 to 1/4 of an inch. One wheel might be chilled 1/4 and another 5/8 of an inch, and there would be several degrees difference in size, although they were made the same day and at the same heat. If any way could be devised of sizing these wheels precisely alike, and casting them in a chill of precisely the same size, the problem would be solved. He was at work on a contract for 6,000 wheels in which 1/4 of an inch was ordered to be added to the standard. If 1/4 an inch had been ordered he could not have done it.

Mr. Adams was aware that a great difference existed in the width of treads, but he did not know before that such specific orders were given about it. The wheels on New England roads almost invariably had 3¾″ inch treads from from the base of the flange. He could not understand why a greater width was needed, for they never run on the rail at the outer edge, and consequently the service of the wheels was not increased.

Mr. Sweet suggested that there was more danger of wheels breaking with 4¼″ inch treads than with 3¾″ or 4 inches. He thought that the wider the tread the more risk there was of breaking or chipping in passing frogs.

Mr. Snow said his experience was exactly the reverse of this. He had some years ago given a curvature to the tread, starting 3/4 of an inch from the outside edge, and curving round to about 5/8, for the purpose of lessening the liability to chip out. Since then, none of his wheels had chipped out on the treads so far as he was aware. The wheels that chipped the most had 3⅛″ and 3¾″ treads. He chilled them clear out, the chill forming a part of the tread clear over. If the treads were perfectly straight they are liable to chip, but if they are rounded there is no danger.

Mr. Garey said that wheel makers supposed, of course, that wheels with the same marks were of the same diameter. He had found, however, from actual measurement of a certain number of wheels of different makers, and of the same mark for each maker, that they varied from a 1/4 to 3/4 of an inch in circumference; and furthermore, that it was very difficult to get more than 4 wheels out of 10 that were uniform in this respect. In view of the fact that it was the custom of many shops to rely solely upon the foundry marks in pairing wheels, and which made the foundry men responsible for the flanging, he would ask the sense of the meeting in regard to the expediency of marking wheels at all.

Mr. Snow thought the proper thing would be for all car-builders, or those who did the fitting, to size the wheels, no matter whose make they were, and to have a gauge for the purpose, and take either diameter or circumference. He preferred the circumference.

Mr. Garey said that a vote on the points suggested by Mr. Snow would leave the matter just where it is now. His object was to fix the responsibility on those who put the wheels on the axles, or, in other words, he was for trusting these men to size the wheels rather than the manufacturers, and this because he believed many of the wheels were wrongly marked at the foundries.

The question was put to the meeting and all voted *against* marking wheels, as to size, at the foundry.

Mr. Gill, of Pittsburg, suggested that the wheel fitters in railway car shops were as liable to make mistakes in sizing wheels as the foundry men were. He never had sized wheels for other persons to fit unless so directed. As to the width of tread, his customers ordered wheels varying fully an inch in this respect, and the instructions from some of the western branches of the Pennsylvania R. R., although governed from one point (Altoona) were so different as to cause great trouble to the wheel maker. One wants the outside of hub to come within 1/8 of an inch of the oil-box, another 3/4 of an inch, and so on, in many other respects, which he enumerated. If the master car-builders would agree upon a standard, he thought the wheel makers would very gladly adhere to it. It would save them thousands of dollars every year to be rid of this constant trouble.

Mr. Hill remarked, in respect to metallic measuring tapes, that those of steel or iron are contracted by cold and expanded by heat; but that with brass tapes it was altogether different; they contracted by heat and expanded by cold, and consequently on a cold day the brass tape is longer and the circumference of the iron wheel a very little smaller, thus making the greatest relative difference between the two. A standard of measure was only a standard at a certain temperature.

This statement, as to the opposite effects of temperature upon brass and iron was a surprise to many of those present and gave rise to an irrelevant discussion of some length, which we omit.

Mr. Garey suggested that the wheel makers should get templets for 33-inch wheels from one source, so as to have them all alike.

[The great length of the discussion compels us to defer the remainder until our next issue.]

The following letters were read to the meeting:

LETTER FROM MR. P. H. DUDLEY.

PHILADELPHIA, Dec. 14, 1881.

L. GAREY, Esq.,
President M. C. B. Association:

DEAR SIR: In answer to your inquiries about the wear of wheels and rails, I would say, that numerous stock inspection diagrams on different roads indicated by form of the surface wear of rails, that much of the abrasion is caused by slipping of wheels of locomotives and cars, which can readily be seen by an increased wear of rails at stations, curves and gradients. The best steel rails wear nearly smooth, but on the majority of rails, the surface wears into a series of waves, the high points being but a few inches apart. These are quite distinct in character from the long waves on the rails due to permanent set. Different diameters of wheels on the same axle, and eccentric wheels, must make up any difference in their radii for each revolution, which can only be done by slipping. Small as this may be for each wheel in the hundreds of wheels which daily pass over the trunk lines, the aggregate effect is quite marked. The wear is reciprocal, and affects wheels as well as rails.

Turned chilled wheels, without any coning, under my car, have made over 30,000 miles with a loss of 1/32 of an inch in diameter. A recent turned chilled wheel under a car has run 32,000 miles, with a loss of 1/640 to 1/800 of an inch in diameter. Its rate will be less as soon as the tread more nearly corresponds to that of the rail. This morning I had six pairs of promiscuous wheels mounted in bearings to test their eccentricity, with the following result:

		Amount of eccentricity in 64ths of an inch. 1st.	2d.	
B	1	4	6	slid wheels.
	2	4	5	new "
	3	4	5	" "
L	4	4	4	2 waves.
B & O	5	3	3	" "
	6	3	5	all freight wheels.

Some eccentricity was due to the boring, but not all. The treads are not true circles, but full of waves. The first pair of wheels mentioned were removed because they had been slid. The flat spot was at right angles to the greatest radius. In most cases, the greatest radii of a pair of wheels were on opposite sides of the axle. Eccentric wheels are a very common cause of the tremor felt in cars when running.

Yours truly, P. H. DUDLEY.

Mr. N. P. Bowler, of the firm of Bowler & Co., Cleveland, Ohio, writes as follows:

"The best size for a car wheel is 33 inches. The safest tread is 4 inches, with but little coning. The weight of a wheel for a 20-ton car should not be less than 535 pounds, the thickest part of the flange 1⅝ inches, thickness of the outer edge of tread 1½ inches, with the web of wheel not very far back from this outer edge. These points, with the weight of 535 or 540 pounds otherwise properly distributed, will make a wheel sufficient for any car."

Proposed Standard for Links and Pins.

The following resolution was adopted at a meeting of car-builders, held in Buffalo last January, and representing the New York Central and a number of connecting roads. The object of the meeting was to agree upon dimensions for a standard coupling-link and pin, and recommend the adoption of the same by the roads. The publication of the resolution has been deferred until inquiry could be made in reference to the probable number of draw-bars in use that the proposed standard would not fit. The number of such draw-bars having been found to be inconsiderable, the resolution is now published, and is as follows:

Resolved, That the measurement inside of link be 10 in. and 1¾ in. wide.

That the section of iron forming the link shall be what is known as D shape, measuring 1⅜ in. vertical section and 1¼ in. horizontal section for the sides of link, the ends to be enlarged to 1½ in. horizontal section and gradually tapered into the sides.

That the body of the pin be made 1½ in. diameter and 10 in. long from under the collar or shoulder to the point. The head of the pin to be so formed that an eye-hole be made through it for the purpose of securing it to the car by a chain.

That the heads of all new draw-bars be made to suit the new link and pin, and that when old cars are taken into shops for repairs the pin-holes of old draw-bars be reamed out, or made large enough to admit easily the new pin.

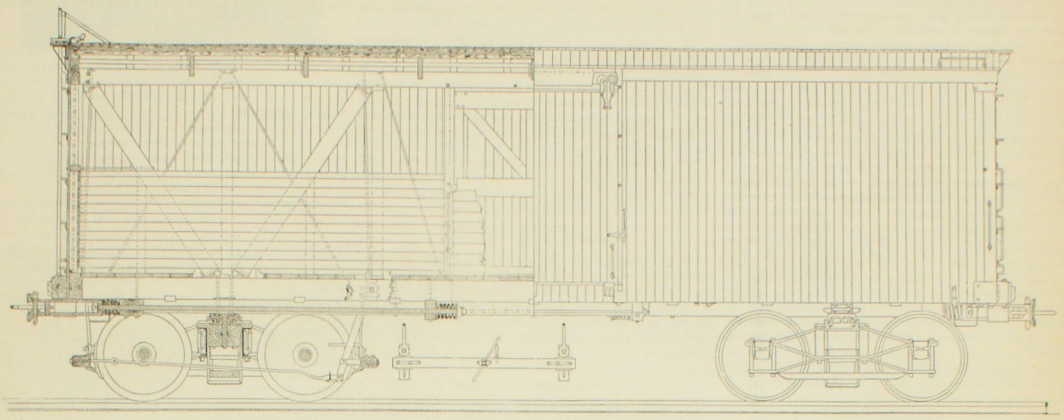
That the quality of iron used for links and pins shall be such as will stand a tensile strain of not less than from 45,000 to 50,000 lbs. per square inch of section, and to have an elastic limit of not less than 30,000 lbs. per square inch, and to resist fracturing by slight hammering or concussions while under strain.

Journal of the Association of Engineering Societies.—This is a new journal, conducted by a board of managers representing the Boston Society of Civil Engineers; the Engineers' Club of St. Louis; the Western Society of Engineers, and the Civil Engineers' Club of Cleveland. Mr. H. G. Prout, 12 Barclay street, New York, is Secretary of the Board. The first number contains contributions from the several societies upon various subjects of scientific interest, a history of the joint association, under whose management the *Journal* is published, and also of the separate societies. The object of the publication appears to be to establish a greater community of interest between the four societies named than has hitherto existed, and also to receive into the joint association any new societies that may be formed, and that may conform to the rules and regulations provided. In this way a more effective co-operation between the separate local organizations is likely to be secured, and, by a permanent record of the transactions of each in a journal conducted by a representative board, a beneficial influence will be exercised upon the organization of engineering societies in the future.

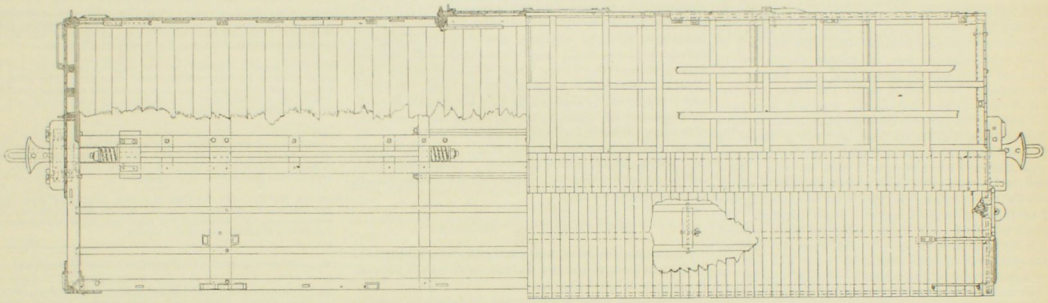
THE *Southern Lumberman* is a new semi-monthly paper published at Nashville, Tenn. As its name imports, it will make a specialty of the lumber interests of the South, a field which is beginning to attract wide attention, and upon which the manufacturing industries of the country will in the future be largely dependent. The first number of the paper is well printed, and contains a variety of readable matter, both editorial and selected. Published by the Lumberman Publishing Co., and conducted by A. E. Baird. Price $2 a year.

THE *Southwestern Railway Advance* is the name of a new and attractive looking paper just started at Galveston, Texas. It is devoted exclusively to railway interests, and especially to the developement of railway progress in the Southwest, a region which presents an inviting field for a well-conducted and enterprising journal of this class. Whether it is weekly or monthly is not stated, but we infer from the price ($2 a year) that it is monthly. Robinson & Steele, proprietors and editors.

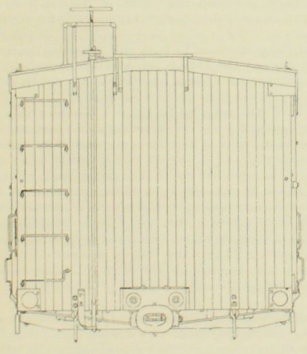
STANDARD BOX FREIGHT CAR OF THE NEW YORK CENTRAL MICHIGAN CENTRAL LAKE SHORE; AND CANADA SOUTHERN RAILROADS.



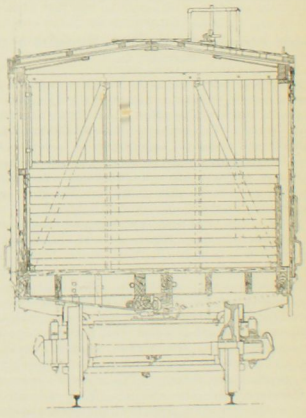
Side Elevation.



Floor Plan. Roof Plan.



End Elevation of Body.



Cross Section.

GENERAL DIMENSIONS.

Length of car outside of sills	29 ft. 0 in.
Width of car outside of sills	8 " 6 "
Height of car, bottom of sill to top of plate	7 " 3 "
opening	5 " 0 "

BODY TIMBERS (finished sizes).

Side sills	Georgia pine	4¼	x 8	in. x	28 ft.	5	in.
4 Intermediate floor timbers,	Georgia pine	2¼	x 8	" x	28 "	5	"
2 Center floor timbers	Geo. pine	4¼	x 8	" x	28 "	5	"
2 Plates, top bev'd to angle of roof	Georgia pine	3	x 6	" x	29 "	1¾	"
2 End sills	White oak	5	x 9¾	" x	8 "	6	"
2 Cross-tie timbers	"	4	x 7½	" x	8 "	6	"
4 Draw-bar timbers, double spring	Georgia pine	5	x 6	in. x	8 ft.	9¼	in.
2 Draw-bar timbers, double spring	Georgia pine	4¾	x 5	" x	6 "	2	"
2 Draw-bar timbers, double spring	Wh. oak	6¼	x 8	" x	1 "	6	"
2 Buffer blocks	"	5⅝	x 8½	" x	2 "	2	"
2 Brake hanger timb'rs.	"	4	x 8	" x	1 "	3⅝	"
4 Corner posts	"	3¾	x 5¼	" x	7 "	3	"
4 Door posts	"	3½	x 4½	" x	7 "	3	"
8 Intermediate posts	"	2	x 4	" x	6 "	0	"
8 Cripple studding	"	2	x 3	" x	3 "	4	"
6 End posts	"	3	x 3	" x	6 "	2½	"
4 End braces	"	3	x 3	" x	6 "	1½	"
8 Side braces	Geo. pine or oak	2	x 6	" x	6 "	11	"
2 End plates	"	3	x 11¼	" x	8 "	6	"
7 Main carlines	"	1¾	x 8¼	" x	8 "	3	"
32 Carlines	"	1⅝	x 2½	" x	4 "	5	"
4 Carlines	"	1⅝	x 3	" x	4 "	5	"
6 Purlins	Geo. pine	1⅝	x 2½	" x	29 "	0	"
2 Purlins	"	1½	x 3	" x	29 "	0	"
1 Ridge pole	"	1⅝	x 5	" x	29 "	0	"
6 Door frame stiles	Geo. pine or wh. ash	4¾	x 5	" x	6 "	1½	"
2 Top rails	Nor. or Geo. pine	⅞	x 7	" x	5 "	3	"
2 Middle rails	"	⅞	x 7	" x	5 "	0	"
2 Bottom rails	"	⅞	x 7	" x	5 "	3	"
4 Door braces	Wh. pine	⅞	x 4				
2 Door stops	Wh. oak	2	x 1¾	" x	6 "	6	"
Fascia boards	Geo. pine	1⅝	x 5				

Flooring, Geo. pine, 1¾ in. thick, not over 6 in. wide, planed, tongued and grooved ¾ in. from face; tongue ⅝ x ⅜ edge rounded.

Sheathing, wh. pine, ¾ in thick, not over 3 in. wide, planed, tongued and grooved, with ¼ in. bead on edge.

Inside lining, wh. pine, ⅝ in. thick, planed, tongued and grooved.

Beveled strips on floor below lining, 1¾ x 1¾ in.

Capping over inside lining, wh. oak, 2¼ x 3 in.

Roofing over iron roof, wh. pine ⅞ in. thick, planed, tongued and grooved, not over 6 in. wide, free from sap shakes, black or loose knots, or other defects.

TRUCK TIMBERS (finished sizes).

2 Truck bolsters, wh. oak		8	x 12	in. x	5 ft.	9	in.
2 Spring planks	"	2¼	x 11¾	" x	5 "	9	"
2 Brake beams	"	4	x 6	" x	5 "	9	"

CONSTRUCTION.

Side sills, floor and intermediate timbers, framed to end sills by double tenons. Centers of bolsters 4 ft. 10 in. from outside of end sills; centers of cross ties 11 ft. 3 in. from outside of end sills. Intermediate posts framed for cast-iron pockets. Side and end braces to have cast-iron shoe or pocket, allowing ends of braces to be cut square. Bolsters to be made of wrought iron; top iron 8 x ½ in., bottom iron 8 x ⅝ in., welded at the ends. Hoit's double spring draw-bar and buffer to be used. Buffer blocks held in position by 2 pieces 3 x ¾ in. wrought iron; buffer to be of wrought iron 28 in. long, shank 5 in. wide and 6 in. deep, and

held in position by draw-bar stirrups of 8 x ⅝in. iron, and plate of 8 x ¼ in. iron over top. Buffer and draw springs to be of crucible cast steel, with capacity of not less than 18,000 lbs., and manufactured by the French Spiral Spring Co. Draw bar rods 1⅝ in. round iron with 4½ in. of each end upset. Each side of car to have four ¾-in. vertical rods passing through side plate; each end of car to have two ½-in. tie rods, one across top through side plate and corner irons and let into end plate, the other through corner post directly over top of capping. Size of doors 6 ft. 1⅝ in. long, 5 ft. 3 in. wide, and 1⅝ in. thick, supported at top on wrought-iron bar 2 x ⅝ in. set upon edge and blocked out with castings. Roofing to be "Winslow's Patent Galvanized Iron Roof." Brake standard to be 1⅛ in. round iron, enlarged at lower end S in. long by 1½ in. diameter. Brakes to be hung to car body. Each end of car to have 5 wrought-iron steps. Corners of cars at steps to be furnished with wrought-iron handles 14½ in. from out to out of bend; distance from bottom of sill to center of handle, 2 ft. 5½ in. Center pins 1¾ in. round iron, 12 in. long.

Trucks to be the New York Central R. R. standard pattern, of which an illustrated description will be found in the CAR-BUILDER for May, 1881. Wheels to weigh 525 lbs. each, and to be pressed on axles at a pressure of not less than 60,000 lbs. Truck springs to be N. & A. Middleton's 20-ton steel springs. Screw threads, bolt heads and nuts to be in accordance with the standard adopted by the Car-Builders' Association, at Richmond, Va., June, 1871, and known as the Sellers Franklin Institute Standard.

IRON IN CAR.

Wrought iron in car body	2,244	lbs.
Cast " " "	671	"
Steel " " "	104	"
Malleable " " "	133¼	"
Wrought iron in trucks, including axles	3,144	"
Cast " " " wheels	5,366	"
Malleable " " "	48	"
Journal bearings	80	"

Engraving by Sand Blast.

This is one of the most curious and strange of the inventions which have come into use in these later days. To make an inscription upon a marble slab, cover the face of the stone with a sheet of wax no thicker than a wafer; then cut out in the wax the name, date, etc., leaving the marble exposed. Now pass it under the blast, and the sand shall cut it away. Remove the wax and you have the cut letters. To cut or mark plate glass, cover it with fine lace and pass it under the blast, and not a thread of the lace will be injured, but the sand will cut deep into the glass wherever it is not covered with the lace. Now remove the lace, and you have a delicate and beautiful figure raised on the glass. In this way beautiful figures of all kinds are cut in glass, and at a small expense. The workmen can hold their hands under the blast without harm, even when it is rapidly cutting away the hardest cutting glass, iron or stone; but they must look out for finger nails, for they will be whittled off right hastily. If they put on steel thimbles to protect their nails, it will do but little good, for the sand will soon whittle them away; but if they wrap a piece of soft cotton around them they are safe. You will at once see the philosophy of it. The sand whittles away and destroys any hard substance—even glass—but does not affect substances that are soft and yielding, like wax, cotton, fine lace, or even the human hand.

Standard Passenger Coaches of the Baltimore & Ohio Railroad Co.

This company is building at the Mt. Clare shops, in Baltimore, a number of passenger coaches, the style and construction of which will be adhered to in future as a standard for the road. Two or three of these coaches are already completed, and we had an opportunity to inspect one of them a few days since at Jersey City. The body of the car is 52 ft. 9 in. in length, and seats 54 persons, with plenty of room for two stoves. The seats are 36 inches apart, have Buntin frames, and are upholstered in scarlet plush. The foot-rests are straight sticks made fast to the frame. There are 17 windows on a side, with 30 × 22 plate glass and double blinds. The door windows have double sashes, and the upper one can be lowered more or less for ventilation. The inside finish is in solid mahogany, except the ceiling, which is decorated oak relieved with mahogany moldings. The space between the floor and windows is sealed with narrow strips running up and down. The window panels are 10½ inches wide, with channeled ornamental grooves in rectangular form crossing at the corners. This style of ornament is also introduced above the windows. There are end ventilators in the clear-story, protected from sparks and cinders by fine wire cloth under the hood; also a small adjustable ventilator, 6 × 24 inches, over each of the end windows, with wire screens on the outside. Howard ventilators, 8 on each side, are used in the roof; the dome lights are made fast. The lighting is by three of Howard's double-burner center-lamps. The parcel racks are nickel plated combined with gilding, are somewhat smaller than usual, and there are six on a side.

Of the style and general effect of the inside finish we may say that, although the material is rich and the workmanship first-class, there is no attempt at mere display or straining after effect. The ornamental treatment of the wood-work is in accordance with the too much neglected principle of ornamenting construction instead of constructing ornament, and the result is a prevailing harmony through out and a general unity of forms, lines and colors that is pleasing and satisfactory, and suggestive of good, honest, intelligent work. It may be said that an exclusive mahogany finish is more somber and less cheerful than that of ash or some of the lighter colored woods; but as an offset to this, it will retain its beauty for a greater length of time, while the lighter woods soon get begrimed and soiled. The outside of the car is painted a chocolate color, relieved only with plain striping, the usual lettering and numbers.

Four-wheel trucks are used, with M. C. B. standard axles and Cliff, Righter & Co.'s equalizer springs. There are two check-chains to each truck, fastened to cross timber in floor frame. Double iron body-bolsters are used, Janney couplers and buffers, and Westinghouse automatic brakes. The car body is 6 ft. 3 in. longer than that of the standard coaches of the Pennsylvania Railroad.

Accidents from "Frogs."

"It is suprising," says the report of the Railroad Commissioner of Michigan, for 1881, "that in view of the number of lives that are crushed out every year, by employés being caught in frogs, that some device has not been adopted to render them less dangerous. They are the very jaws of death. An employé once caught within their embrace, as a train is moving upon him, has little hope of escape. The last legislature passed a bill upon this subject, requiring railroad companies to block the points of danger, which, upon a full investigation, was deemed impracticable, and it failed to become a law. It would seem that some method could be adopted to prevent the foot being caught, which would be practicable, and not interfere with the full use of the switch; I do most earnestly urge upon the railroad companies the attempt at least to devise some such system. Humanity demands it. It will not do to say that employés should not go between cars when they are in motion for the purpose of coupling, and therefore no remedy should be devised. The accident does not always occur in coupling, and although in coupling the cars to be connected may be standing still, the cars moving toward them may come with such motion as to cause the brakeman to be caught in the frog. The stick which is adopted by some roads does not remedy the evil, for frequently the difficulty in coupling is such that there is no other practical way than to pass between the cars. There is no question but that the frog in its present condition without some guard is barbarous. I hope some action will be taken to remedy it. If the railroad companies will not, the legislature should."

Cars Lighted by Electricity.

The London *Times* contains the following in reference to a trial trip made by the new Pullman train on the London, Brighton & South Coast Line:

"Single cars of the American pattern have been running on this line for five or six years, but this train is made up entirely of Pullman cars. The train includes a parlor car, a drawing-room car, with ladies' boudoir and dressing-room, a restaurant car, and a smoking car, while a compartment at each end of the train next to the luggage compartment is provided for servants. The cars are kept at an equable temperature by means of hot-water pipes. There is electric communication between the parlor, drawing-room smoking and restaurant cars, and in many ways the comfort of passengers is provided for. The most important and novel feature of the new train is, however, that it is lighted throughout by electricity. As the train entered Box Hill and other tunnels on the Dorking, Horsham and Steyning route, by which the trip to Brighton was made, the cars were simultaneously, and by the mere turn of a handle, brilliantly lighted, and as quickly, when the train emerged, the light was turned off. On the return journey the cars were lighted all the way from Brighton to Victoria, the lamps burning with a steadiness undisturbed by the motion of the train. The trial confirmed the results of an experiment made some few weeks ago with a single car, and proved the possibility of satisfactorily lighting a whole train by electricity. The lamps used yesterday were Edison's incandescent lamps, of which altogether there were 29 distributed in various ways throughout the train, the drawing-room car being sufficiently illuminated with an effect of pleasantly diffused light by five of them. Each lamp was computed to be giving a light equivalent to that of nine or ten candles As one of these Pullman cars is 58 ft. 5 in. long, the length of train to be lighted was over 233 ft. The electricity was supplied by Faure accumulators, of which 80 were carried. Mr. W. Lachlan, the engineer in charge of the batteries, reported that but 30 were brought into use on the down journey, and only a portion of the electricity stored in these was expended. On the up journey these and four fresh boxes were brought into operation. For the present the accumulators will be charged each evening at the society's depot at Charing Cross, but as soon as the necessary arrangements can be made it is intended that the recharging shall be done at Victoria with a dynamo machine worked by a small stationary engine. It is not improbable, however, that before long the electricity required may be generated on the train itself, the chief practical difficulty in the way of this saving of force arising from the unavoidable alterations in the speed of the train—a difficulty which the ingenuity of the electrical engineers will no doubt soon overcome."

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and copies kept for sale, at the following places:*
A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*
L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*
WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*
ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

WE begin the thirteenth volume of the CAR-BUILDER with an increase in the size of its pages. This has become necessary in order to afford more space for engravings and reading matter, and to meet the increasing demands of advertisers. The change we have no doubt will be acceptable to our readers, especially as it is not attended with any increase in the price of subscription.

We have also consolidated the two directory lists of railways and railway officers heretofore published, placing the names and titles of the officers in charge of the operating, purchasing and rolling-stock departments, under the names of the respective roads. The gauge, track mileage, and number of cars and locomotives, according to the most reliable information, are also given. While such a list can not in the nature of the case be made complete and accurate in every detail, we shall try to keep it as nearly so as possible, relying on our readers, and especially road officers, to give us prompt advice of errors, omissions and current changes.

OUR supply of CAR-BUILDERS for April, September and October, 1881, is exhausted. We will pay ten cents a copy for any of these numbers that may be sent to this office.

SUBSCRIBERS who write to us to have their places of address changed are particularly requested to give their previous address. This will save a great deal of time in searching for it through a list of many thousand names.

ACCIDENTS TO RAILWAY EMPLOYES.

The Legislative Assembly, of Ontario, Canada, appointed a committee last year to investigate the subject of accidents to brakemen and others employed on railways. The report of the committee has just been published, embodying a mass of testimony which throws a good deal of light on the general subject, and more particularly the diversities which prevail in freight-car construction in the matter of protection to trainmen. It is a document which should be carefully studied by managers and superintendents, many of whom are, apparently at least, indifferent to the construction of their cars in those points which tend to increase or diminish the hazards of the service—an indif-

ference which arises, not from any lack of sympathy for human suffering, but because their attention is absorbed in other and more pressing duties. The report is too long for our space, and we shall therefore only call attention to the more salient points of the testimony, and to the conclusions to which the committee have arrived.

In respect to precautionary means, there is a substantial agreement in favor of side-ladders; running-boards from 2 to 3 ft. wide, and projecting over the ends of the car; brake-wheels, ratchet and pawl on top instead of at the ends; uniform length of draw-bars, dead-woods and coupling-links, and bridges not less than 7 ft. from top of cars. Upon other points that were suggested, as affording security against accidents, the testimony is more or less conflicting. Hand-railings at the ends and sides of cars, and along the running-boards, are strongly recommended by some, and condemned by others, as being only an aggravation of the difficulty; coupling-sticks are approved and disapproved; a few patent draw-bars and couplers are favorably mentioned, including Safford's, Wright's and Lapham's. A passenger conductor testifies that most of the accidents to brakemen and others on freight trains happen to fresh and inexperienced hands, while Mr. Spicer, Manager of the Grand Trunk road, says that accidents happen more frequently to men who have been long in the service, and who have thereby become indifferent to danger. There seems to be a concurrence of opinion that, when trains are running, men fall off the ends of cars far more frequently than from the sides; and that a large proportion of casualties is primarily due to defective brake apparatus—no trains having good brakes throughout, and some with effective brakes on not more than an average of two cars in fourteen. In regard to accidents from getting the feet caught in frogs, it is suggested that the only practical safeguards are to fill the frogs with wood or other material, or that trainmen should wear loose shoes out of which they can readily slip their feet in an emergency.

Mr. Broughton, Manager of the Great Western road, testifies that he never heard of an accident in England from coupling cars. Considering the number of men employed on the Canadian lines, and the number of couplings made, the proportion of injuries is very small—the estimate for the Great Western road being 1 man killed and 14 injured to 50,000 couplings. He presented a statement showing that out of 200 brakemen on his road, 100 had been five years in service, and that the accidents to train, yard and switchmen, for five years (1875 to 1879 inclusive), were as follows:

	Killed.	Injured.
Coupling cars	4	80
Falling off cars	6	10
Brakes failing	0	4
Caught in frogs, guard or wing rails	2	3
Trains thrown from track	8	6
Other causes	5	13
Totals	25	116

From the testimony submitted, the committee make the following recomendations:

1. That all overhead bridges should be built so as to have a clear space of at least 7 ft. from the top of the highest freight car to the lowest member of the bridge above.

2. That the running-board upon freight cars should be as nearly flush with the roof of the car as possible, and not less than from 24 to 30 in. wide, and extended as far as the dead-wood of the cars will safely admit, so as to leave as little space as possible between the ends of the running-boards on each car, and also that a hand-rail should be placed along the side of the running-board, to be not less than 30 in. in height.

3. That your committee examined a large number of automatic and other couplers for freight cars, some of which appeared well fitted for the purpose of coupling, and would go far to do away with the necessity of the men going so frequently between the cars. The committee would therefore suggest whether, in view of the great loss of life and injury to brakemen in coupling cars, it is not desirable that the adoption of automatic couplers should be made compulsory upon Canadian railway companies.

4. That all frogs and wing rails on railways should be filled in with wood, according to the system now in use on the Northern Railway.

5. That the letter of Mr. C. J. Brydges, as well as the statements of others, strongly favor the adoption of braking by means of vans as used upon English railways, but your committee were not able to obtain sufficient evidence to warrant them in expressing a decided opinion upon this point.

SUBURBAN PASSENGER TRAFFIC.

It is evident that there is a large opportunity for the profitable development of this class of traffic in the vicinity of large cities, and that more attention is likely to be given to it in the future than there has been in the past. The population of the numerous towns and villages within a radius of ten or fifteen miles from these great commercial centers is rapidly increasing, and the increase is very much in proportion to the facilities afforded for cheap and speedy transit. This branch of railway business has hitherto been comparatively neglected for the reason, apparently, that low fares and frequent trains have not proved remunerative for longer distances, and under other conditions. The success of passenger business, either for long or short distances, manifestly depends on its strict adaptation to the wants of the people who live contiguous to the line of road. The time and cost of transit determines how far a person can afford to live from his place of business, and the distance must vary of course according to the nature and profits of his business. If passengers could be discriminated and classified like freight, and fares adjusted so as to keep the seats filled at some kind of rate, instead of running empty a portion of the time, and in one direction at least, the earnings would no doubt be considerably augmented. But persons, as such, can not be manipulated like things in order to meet the varying exigencies that arise. There is a limit beyond which discrimination can not go, and this accounts for the rigidity of rates in the one case, and their flexibility in the other. This rigidity, however, which is an unavoidable feature in passenger traffic, is capable of some relaxation in respect to suburban business; and if the thing is rightly managed, the result will be a profit to the roads, and an increasing stimulus to the settlement and growth of suburban districts.

This appears quite evident from the report of the New York & New England Railroad Co., on the subject of low fares and frequent trains to and from suburban stations in the vicinity of Boston. The plan has been in operation about six months, and even for so short a trial, instead of showing a loss, it has proved decidedly profitable, imparting an increased activity to the trade and business of the towns along the route, and making it clear that the advantages of cheap and rapid transit and frequent trains are shared both by the road and its patrons. This mine of suburban passenger traffic is likely to be worked more vigorously in future by roads centering in large cities. These cities are not strictly those on the seaboard, and the time is not far away when even Chicago will have a score of inland rivals with extensive and populous outlying suburbs suited to the growth of this branch of traffic.

VENTILATION OF PASSENGER CARS

A leading railway journal suggests that every editor should write an article on this subject at least once a year. We cheerfully comply with the suggestion, and unless special reasons shall seem to require it will not refer to the matter again editorially for the ensuing twelve months. As we wish to treat the subject as exhaustively as possible, consistent with brevity, we will venture the proposition, to start with, that an ordinary platform car is the most perfectly ventilated of any style of car now on the roads. The unwholesome air, smoke and cinders that might otherwise accumulate on the platform are instantly swept away by an unobstructed current of pure air, especially if there is much of a breeze blowing; and this without the aid of expensive patent ventilators. This is car ventilation in its most simple and primitive form. Passing by the several intermediate classes, including merchandise, stock, refrigerator and caboose cars, which, being more highly organized, can not be ventilated so easily, we come to the most highly organized of all, the prevailing style of passenger cars in use on American railroads.

It would seem at first sight that no kind of closed structure can be so easily ventilated as a passenger car. It is almost always in rapid motion when ventilation is most needed, and surrounded also with a vast volume of fresh air, just as the platform car is. But this fresh air can only get in under certain conditions, namely: There must be openings for its admission, and room for it inside after it is admitted. This is evident from the primitive illustration to which we have referred, and which embodies a principle that should not be lost sight of. The accumulated nastiness generated in a crowded car will not go out unless an opportunity is afforded, and some of it will not go even then unless forced. The force must be derived from the speed of the train, or from an inflowing current induced by rarefaction, or both combined. Dust, smoke and cinders, although annoying, are not deadly, and relief from these must ultimately come mainly from improved combustion and better ballasted tracks. Ventilation, strictly speaking, has to do with air and respiration, and when the appliances for securing it have to be combined with heating apparatus, as is the case with cars in winter, the difficulties of the problem are very much increased. People who travel in this country are bound not to freeze. If the heat furnished is excessive, they can open doors and windows and let it out. If it is insufficient they can worry the conductors and brakemen and abuse the road. Passenger traffic has ceased to be a monopoly, and warm cars are a necessity in order to get business. But as nearly the entire population of the country travel in cars, there are likely to be on all trains nervous and sensitive people mingled with others who are as indifferent to low temperature as so many polar bears, and all of them equally unconcerned about the kind of air they are breathing so long as they feel comfortable. There is also another class of fidgety and fanatical people who have got ventilation on the brain, so to speak, and imagine they are inhaling noxious gases and deadly effluvia with every breath they draw while on a train nicely warmed in cold weather. It is manifest that no heating or ventilating apparatus can be adjusted to suit the varying whims and caprices of everybody.

As for specific methods, we have always favored those which provide for the admission of the external air in such a way that it may be warmed before entering the body of the car, the vitiated air being forced out through exhaust openings next the car floor, and not at the top. In this way none of the incoming warm air is wasted, while the cold air next the floor is forced out and replaced by that which is purer. A much greater uniformity of temperature is also secured between floor and roof, so that the heads of passengers will not be very much warmer than their feet. Many people labor under the impression that cold air and pure air are one and the same thing, but this is not necessarily the case as respects the air in a car. As the railroads, however, do not seem inclined to favor the bottom exhaust theory, we suggest the next best thing, which is an opening in the ends of cars near the top, regulated by slats, so that the air is forced in in front by the impetus of the train, and in an upward direction over the stove so as to be partially warmed, and subjecting passengers to no direct draught. Of course, a corresponding quantity of air must escape from the car at the other end or at the sides. This plan has often been recommended by the *Railroad Gazette*, and we gladly unite with that journal in keeping it before the people as a very good and effective thing indeed.

If the half that has been said by professional experts about the deleterious qualities of the air in poorly ventilated cars is true, the risk of injury from the general run of railroad accidents is a small matter in comparison. Too much importance, as it seems to us, has been attached by car-builders to a critical analysis of the vitiated air in cars, the result of which was to unnecessarily complicate the subject. The elaborate reports and discussions at the meetings of the Car-Builders' Association a few years ago have doubtless done much toward securing better ventilation for cars. We are inclined to think that about all that can be done has been done, and that the amount of misery endured by travelers on this score is not in the aggregate very alarming. Our passenger cars of the better class are as well provided with ventilating appliances as the nature of the case will permit. This is now pretty well understood by car-builders and the traveling public, and both are likely to rest content with the usual side, top and end ventilators as the simplest, cheapest and most effective way of preventing the accumulation of bad air. We would not of course discourage improvements. Let us have all that are really such, and practicable; but we think that as a rule our cars are provided in this respect with all the great mass of travelers need or care for, if not all the companies can reasonably be expected to furnish.

BUSINESS CIRCULARS.

The quantity of this class of circulars sent through the mails in unsealed envelopes is almost beyond computation. They are both general and local in their character, and relate to every kind of trade and manufacture, professional calling, small enterprises, and the whole category of humbugs withal, whose name is legion. The plan is considered by many as a cheap and effective mode of advertising, but this we think is a mistake. However it might have been during the early stages of the mania, the thing has been carried to such an excess that it has become in the aggregate outlay the least remunerative of all modes, for the reason that circulars of this class have got to be a prodigious bore in all well ordered business offices. The number that go unread into the waste-basket from sheer inability to give them attention, increases every day, and we can not but think that the fever has about reached its height and will soon begin to abate. No scientist, however enthusiastic, can spare time for a critical analysis of every snow-flake that falls on his premises during a flurry, nor can a business man do much better in dealing with the daily flood of circulars that reach him in one way or another. Every business concern of good standing is nowadays supposed to take one or more special journals published in the interest of some particular line of business, and in the advertising columns of which its business is represented. These journals are the appropriate channels or mediums of communication between such concerns and their customers, and vice versa. They are usually provided with an index and kept on file, so that by referring to them any one can see at a glance the advertising cards of all the prominent dealers, manufacturers, consumers, etc., that he desires to know or communicate with in the interest of his own business, and without searching for them among a mass of miscellaneous advertisements in which he has no interest at all.

In what we have said we do not include the general run of catalogues, price lists, etc. These are usually too bulky, expensive and elaborate to be sent in very great numbers through the mails. We refer only to circulars of the standard regulation styles, and venture the assertion that more money has been wasted on them than ever will be again in the same length of time. They are doubtless a good thing for printers, paper makers, and possibly for the postal service; but as men grow wiser they will outgrow the delusion that it is cheaper to send out circulars to make their wares known than it is to advertise in a well-selected, long-established and widely-circulated class journal.

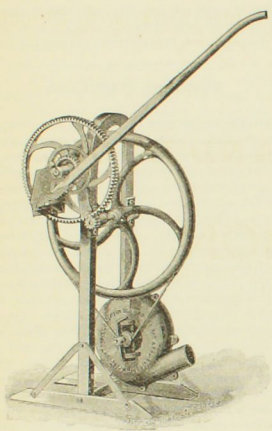
THE annual reports of the Baltimore & Ohio and Boston & Albany roads, for the year ending Sept. 30, show a diminished revenue as compared with the previous year, and this in the face of an increased passenger and freight traffic. The Erie, for same fiscal year, increases its earnings on passenger and coal traffic, but loses on other freight. The reports of the other trunk lines, and their east and west connections, will doubtless show a similar result, which of course can only be attributed to the needlessly low and unremunerative rates caused by cut-throat compe-

tition. These "war" rates are not only a reckless throwing away of hard-earned millions by the belligerent roads, but they are an exceedingly bad precedent in view of possible contingencies in the future, which may cause them to be quoted as a basis for hostile legislation. Anti-monopoly agitators are industriously striving to get up a popular crusade against railroads, as corporations, and should this unhealthy sentiment swell into a great political hue and cry, and lead to legislative interference, these competitive rates would rise up to plague the inventors. Ruinous and unremunerative as they are, they could be effectively quoted as having been established by the roads themselves. The average demagogue, with an unreasoning constituency behind him, is too unscrupulous and time-serving to give much heed to vested rights or the mutual relations and interests of railroads and the great business community.

WE give in this issue drawings and principal specifications of 29-foot standard box freight car adopted a year ago by the so-called Vanderbilt roads. Our future issues will contain similar drawings and specifications of the other freight cars adopted as standards by these roads.

New Hand Blower for Forges.

The old-fashioned, cumbersome leather bellows in blacksmiths' shops is rapidly giving way to the modern hand fan blower, a new style of which is shown in the engraving. For hand use this whole apparatus weighs only 135 pounds, and for power use 140 pounds. It has a wrought-iron frame of angle iron riveted together, so that it is perfectly rigid and is not affected by fire or the weather. The fan is operated by a coiled steel wire belt. The wind capacity is sufficient for two fires, and is easily worked by the swiveled handle. The bearings are Babbited, and the



main gear wheel is put in motion by common dogs and ratchet plainly exposed to view. The latter device is claimed to be simple and stronger than a complicated inclosed pawl and ratchet clutch. The blast is claimed to be steady and uniform, and by means of an adjustable tuyere can be varied from the slightest current of air to the most ample blast required. By this device the operator is enabled to augment the volume or quantity of the blast without over-increasing its strength, which it is claimed cannot be affected by the bellows or any other force blower. This hand blower, which is known as the "Western," is manufactured by the Empire Portable Forge Co., Cohoes N. Y.

A correspondent of the Boston *Courier*, who signs himself "Ex-Brakeman," claims to have invented an antomatic car coupler that not only "fills the bill," but is "absolutely faultless," and that the railroads have only to adopt it in order to save 3,650 lives per annum, bring down the rates of brakemen's life insurance, and greatly increase the average number of those who now die natural deaths. The writer states, incidentally, that he has given much study to the subject, and that the invention is patented and is now controlled by a company of well-known citizens of Boston. It is to be introduced on a western road operating 1,100 miles of rail, and a working model is permitted to be seen on application. We would suggest, what may perhaps seem superfluous, that the Connecticut Railway Commissioners had better look into this matter before making their report on car couplers to the next legislature.

THE lighting of railway passenger cars by electricity has been accomplished in England with a fair degree of success, as will be seen by an article we copy from the London *Times*. There are, of course, some mechanical drawbacks to a satisfactory working of the apparatus, but these are not of such a formidable nature as to prevent their being overcome by the ingenuity of electrical engineers.

DURING the year ending Sept. 30, there were 35 engines built at the Mount Clare shops of the Baltimore & Ohio Railroad. Of these, 22 were of the largest class of consolidation freight engines, with 20×24 cylinders, 50-inch drivers, and each weighing 51 tons; 12 were for passenger service, with 18×24 cylinders, 69-inch drivers, and weighing 83,200 pounds; and one switching engine with 17×24 cylinders, 50-inch drivers, and weighing 67,050 pounds. The cars built at these shops during the year were 30 eight-wheel passenger cars, 5 baggage, 362 house, 12 express, 594 gondola, 95 hopper gondola, 96 stock rack, 3 double-deck rack, 50 refrigerator, 41 caboose, 20 dump, side dump, stone truck, riggers and flat bottom, making an aggregate of 1,308. All the freight cars built have a capacity of 40,000 pounds.

ARTIFICIAL LEATHER.—This newly invented article is manufactured by the Evans Artificial Leather Co., of Boston. Judging from the specimens before us, it has all the essential qualities claimed for it, and is likely to come largely into use for many purposes as a substitute for leather. It is flexible and durable, is not affected by temperature, is impervious to oil and water, is made of any desirable color and weight, the colors do not fade, and it is very much cheaper than leather, and for many purposes superior to it. It is particularly well adapted for curtains, desk covers, panel and ceiling decoration, book-binding, satchels and a variety of small wares. It is made from 36 to 50 inches in width, and as a substitute for leather has given satisfaction to all who have tried it.

PHOSPHOR BRONZE WIRE.—The peculiar qualities of phosphor bronze alloys are hardness, great tensile strength and toughness, and resistance to corrosion and crystallization. They are of different grades; and while some are exceedingly useful for bearings in which great hardness and small liability to friction are required, there are other grades that have great ductility. Between these are many intermediate qualities, any one of which can be produced with entire uniformity. The adaptation of the metal for telephone wire, both for electric and acoustic lines, is just beginning to be appreciated in this country, although it has been used for this purpose for some time in Europe, and has proved a great success. The advantages as compared with the heavy iron wire are cheapness, durability and efficiency. It will not sag like copper, nor rust like iron or steel, when exposed to the weather; a greater number of wires can be fixed to poles; longer spans and lighter supports can be used; and the sound of the voice is transmitted over them with greater distinctness. As yet, it has been but partially introduced for telephone purposes in the United States, but the demand for it is rapidly increasing. The weight of wire per mile ranges from 20 to 66 pounds, and its tensile strength from 95 to 300 pounds. It is manufactured by the Phosphor Bronze Smelting Co., Limited, 512 Arch street, Philadelphia.

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur:

Boston, Lowell & Concord.—Mr. Jas. N. Lauder, late of Northern Railroad, is Superintendent of Rolling Stock. The Boston & Lowell, Concord & Portsmouth, Manchester & Lawrence, and Nashua & Lowell, have been consolidated into this road.

Buffalo, Pittsburg & Western.—Mr. E. H. Witter has been appointed Purchasing Agent, with office at Oil City, Pa.

Chesapeake & Ohio.—Mr. W. P. Harris, late of New York & Greenwood Lake, has been appointed Superintendent of Western Division; and J. D. Yarrington of the Lexington Division.

Chicago & Northwestern.—Mr. Charles D. Gorham has been appointed Superintendent of the Wisconsin, Milwaukee & North western Union Divisions of this company's lines, vice Edward J. Cuyler, resigned.

Cincinnati, New Orleans & Texas Pacific.—Mr. Cecil Fleming has been appointed General Superintendent of the Cincinnati Southern Division. James Meehan is General Master Mechanic; Jas. B. Brown is M. M. of Vicksburg & Meridan Division; W. Bell Smith, M. M. of Vicksburg, Shreveport & Pacific Division; and A. Thompson, M. M. of Alabama Great Southern Division; Chas. B. Wallace is Superintendent, and R. W. Healey Purchasing Agent, of last-named division.

Cleveland, Columbus, Cincinnati & Indianapolis.—Mr. N. Mark has been appointed General Foreman of Car Department of Indianapolis Division, vice R. Attridge.

Cleveland, Mt. Vernon & Columbus.—The name of this road has been changed to Cleveland, Akron & Columbus.

Columbus, Hocking Valley & Toledo.—Mr. M. P. L. Booth has been appointed Superintendent of Hocking Valley Division in place of W. H. Lott, resigned.

Fitchburg.—Mr. W. A. Foster has been appointed Acting Superintendent of Motive Power, during the absence of Mr. Geo. A. Coolidge in Europe.

Jacksonville Southeastern.—Mr. Ira Petrie is Master Mechanic and Master of Car Department, vice B. J. Miller.

Leavenworth, Topeka & Western.—Mr. George O. Manchester has been appointed General Manager. He was recently on the Atchison, Topeka & Santa Fe.

Louisville, New Albany & St. Louis.—Mr. R. G. Butler has been appointed General Superintendent, in place of H. L. Shephard. Mr. F. M. Mast has been appointed Master Mechanic.

New York & Greenwood Lake.—Mr. J. H. Tinney is appointed Acting Superintendent, vice W. P. Harris, who has gone to the Chesapeake & Ohio.

Northern (N. H.).—Mr. E. Studley, late of Lake Shore & Michigan Southern, has been appointed Superintendent of Rolling Stock of this road, and also of Concord & Claremont, vice James N. Lander, resigned.

North Pacific Coast.—Mr. David Nye has been appointed Superintendent.

Ohio Southern.—Mr. David Ennis has been appointed Assistant Superintendent. He has been for 18 years a conductor on the Erie road.

Oregon Railway & Navigation Co.—Mr. C. C. Hobart is General Master Mechanic in place of J. F. Curtis, resigned. Mr. Hobart has heretofore been on the K. C., Ft. S. & G. road.

Pennsylvania.—Mr. David M. Watt has been appointed Superintendent of the Monongahela Division, vice J. M. Byers.

Pennsylvania Company.—Mr. F. D. Casenave has been appointed Master Mechanic in charge of the Pittsburg, Ft. Wayne & Chicago shops in Ft. Wayne, Ind. Mr. S. M. Felton, Jr., has resigned the position of General Superintendent of the Pan Handle road, and takes same position on the New York & New England.

Peoria & Pekin Union.—Mr. Thos. B. Burnett, late of the Wabash road, has been appointed Superintendent.

Philadelphia, Wilmington & Baltimore.—Mr. I. N. Mills, formerly General Agent of the Delaware Railroad, has been appointed Superintendent of the Delaware Division, including the Delaware Railroad and all its branches.

Pittsburg, Ft. Wayne & Chicago.—Mr. A. B. Starr has been appointed Superintendent of the Eastern Division, vice George S. Griscom, resigned.

Prince Edward Island.—Mr. Joseph Unsworth has been appointed Mechanical Superintendent and Storekeeper. He was recently on the Intercolonial.

Richmond & Allegheny.—Mr. J. P. Williams has been appointed Purchasing Agent, with office in Richmond, Va.

St. Louis, Alton & Terre Haute.—Mr. M. Leclerq has been appointed Master Mechanic, in place of B. Warren, resigned. General Manager G. W. Parker will, for the present, act as Superintendent in place of Mr. Warren.

St. Paul, Minneapolis & Manitoba.—Mr. Allen Manvel has been appointed General Manager, vice Jas. J. Hill, chosen Vice-President.

Scioto Valley.—Mr. C. E. Browning is Master Mechanic, and also has charge of the Car Department.

Sioux City & Pacific.—Mr. C. F. McCoy has been appointed Assistant Superintendent, with office at Blair, Neb., and will have charge of all this company's lines in Nebraska.

Toledo, Ann Arbor & Grand Trunk.—Mr. M. D. Woodford, recently of the Fort Wayne & Jackson, has been appointed General Manager.

Toledo, Delphos & Burlington.—Mr. E. Clemons has been appointed Master Mechanic in place of F. M. Mast; office at Delphos, Ohio.

Ulster & Delaware.—Mr. George W. Wright has been appointed Master Mechanic, with office at Rondout, N. Y. He has served as engineer and machinist on the Lake Shore and Erie roads, and on the government railroads.

Wabash, St. Louis & Pacific.—Mr. B. F. Mathias has been appointed Superintendent of the Rantoul Division, in place of T. B. Burnett.

WANTED.—A situation as Master Mechanic or Foreman by a man who has had seven years' experience as Master Mechanic on a leading road of the State of New York. Would like to open correspondence with railway managers or superintendents with a view to obtaining employment. References as to character and ability, first-class. Address R. R., 14 Church street, Syracuse, N. Y.

WANTED.—A situation as stenographer and type-writer, by a young man who is also a practical machinist, having 13 years' experience in railroad shops. Can furnish first class references. Address STENOGRAPHER, Hornellsville, N. Y.

WESTERN RAILROAD ASSOCIATION.

SECRETARY'S OFFICE, CHICAGO, Nov. 24, 1880.

To the Members of the Association:

GENTLEMEN: Referring to Letters Patent for improvements in Watchmen's Clocks or Detectors, granted to Mr. J. E. Buerk, June 6, 1865; Nov. 3, 1874, and Aug. 29, 1876, and also to the several legal controversies which have been had under these patents; I am instructed by the Executive Committee to say: that the Supreme Court has held the Imhaeuser Clock, a number of which are now used by the members of of the Association, to be an infringement of one or more of said patents. You are further advised that so far as we can ascertain, the clock now being sold by Mr. Buerk is not an infringement of any live patent not owned by him.

I am also instructed by the Executive Committee to transmit to the members an earnest recommendation that in accordance with the above conclusions you should hereafter and till further notice purchase all such detectors or clocks from Mr. J. E. Buerk, Boston, Mass.

In view of the position thus taken by the Association, Mr. Buerk agreed not to prosecute his claim against its members, and has released them from any liability they may have incurred by reason of past infringement of said patents, with the expectation that they will in the future fully respect his rights.

While this release and license is unqualified in its terms, it was executed by Mr. Buerk with the understanding that the members of the Association would uniformly act in accordance with the finding and recommendation hereinabove contained.

Yours truly, J. H. RAYMOND, Secretary, etc.

EASTERN RAILROAD ASSOCIATION.

SECRETARY'S OFFICE, GRAND CENTRAL DEPOT, NEW YORK, May 17, 1881.

To the Members:

GENTLEMEN: Certain Letters Patent of the United States for Watchman's Time Detectors were granted to Edward E. Buerk, as follows: No. 31,052, dated Jan. 1, 1861; No. 48,048, dated June 6, 1865; No. 156,532, dated Nov. 3, 1874; No. 181,310, dated Aug. 29, 1876.

The validity of Mr. Buerk's claim was contested by several suits in the United States Circuit and Supreme Courts, and sustained; what is known as the "Imhaeuser Clock" being held to infringe.

After an examination of said patents, and the records and opinions of the Courts in said cases, the Executive Committee decided that this Association should not defend any infringement of said patents.

In view of the position thus taken by the Association, Mr. Buerk agreed not to prosecute his claim against its members, and has released them from any liability they may have incurred by reason of past infringement of said patents, with the expectation that they will in the future fully respect his rights.

I am therefore directed by the Executive Committee to advise and recommend the members of this Association to carry out the arrangement thus made and to avoid any illegal infringement of these patents by hereafter buying the Watchman's Time Detectors, described and claimed in said patents, only from Mr. Buerk or his authorized agents or licensees.

Will you please cause orders to be issued in accordance with the above to the proper officers of your company.

By order of the Executive Committee.

ANDREW MCCALLUM, Secretary.

CONTINUOUS DRAW-BAR PATENTS.

The following circular has been issued by the Secretary of the Western Railroad Association:

CHICAGO, Sept. 9, 1880.

To the Members of the Association:

GENTLEMEN: Claims have been pending for several years that the Continuous Draw-Bar, sold by the Continuous Draw-Bar Company under the Middleton and the Griffith and Patterson patents, is an infringement of patent 71,580, granted 3d December, 1867 (re-issue No. 8,095, granted 10th February, 1878), to Edward L. Caum.

This Association has continuously advised against entertaining this claim, but to quiet all questions, and at our instigation, the Continuous Draw-Bar Company has recently purchased the Caum patent, its owner inserting in the assignment a full and absolute release to all the members of the Eastern and Western Railroad Associations from any and all liability for, or on account of, any infringement heretofore of said patent. Yours truly,

J. H. RAYMOND, Secretary, etc.

CLARENCE BROOKS & CO.

MANUFACTURERS OF

RAILWAY CAR AND FINE COACH VARNISHES.

Cor. West and West 12th sts., New York.

JOHN W. MASURY & SON,

MAKERS OF STRICTLY FIRST-CLASS

Railway Varnishes,

AND MANUFACTURERS OF

CAR BODY COLORS.

By permission, we refer to the following Companies, for whom we have made Special Colors:

PENNSYLVANIA RAILROAD CO., Enoch Lewis, Purchasing Agent, Philadelphia, Pa.
PENNSYLVANIA CO., Wm. Mullins, General Purchasing Agent, Pittsburg, Pa.
BALTIMORE & OHIO RAILROAD CO., N. S. Hill, Purchasing Agent, Baltimore Md.
CHICAGO & ALTON RAILROAD CO., A. V. Hartwell, Purchasing Agent, Chicago, Ill.
CHICAGO & NORTHWESTERN RAILROAD CO., R. W. Hamer, Purchasing Agent, Chicago, Ill.
LEHIGH VALLEY RAILROAD CO., L. Chamberlin, Purchasing Agent, Philadelphia, Pa.
NORTHERN RAILROAD OF CANADA, F. W. Cumberland, Superintendent, Toronto, Ont.
NAUGATUCK RAILROAD CO., G. W. Beach, Superintendent, Waterbury, Conn.
PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD CO., S. A. Hodgman, Superintendent of Motive Power, Wilmington, Del.
NEW YORK, NEW HAVEN & HARTFORD RAILROAD CO., R. N. Dowd, Commissary, New Haven, Conn.
UNION PACIFIC RAILROAD CO., " " A. D. Clark, Purchasing Agent, Omaha, Neb.
KANSAS " " " Railroad Car Builders.
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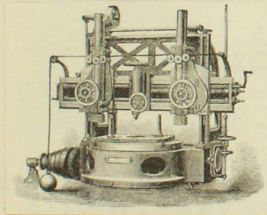

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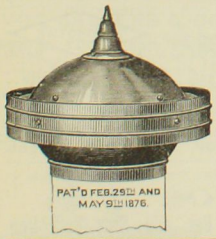

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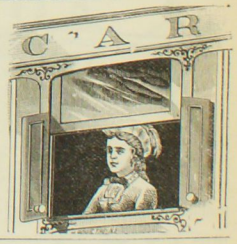

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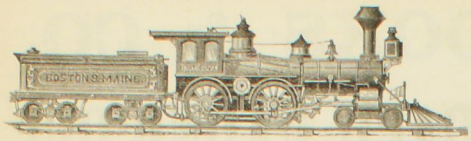

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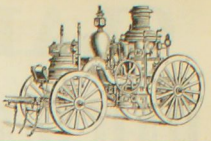

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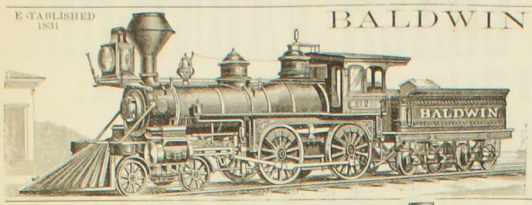

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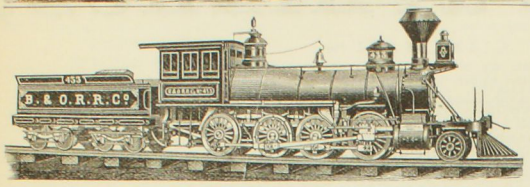

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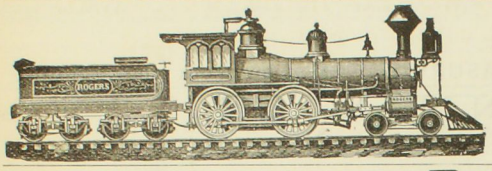

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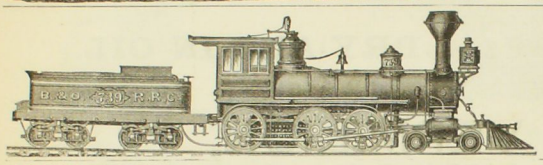

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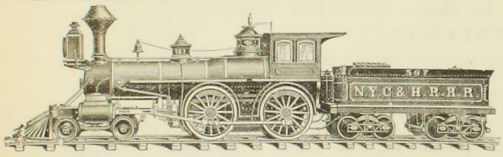

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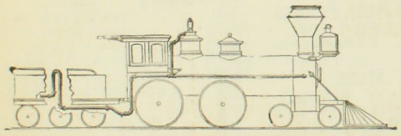

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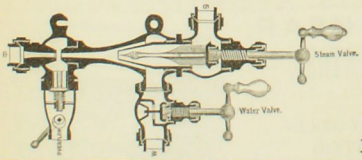

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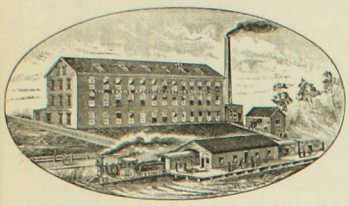

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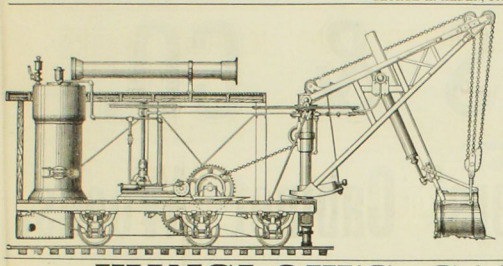

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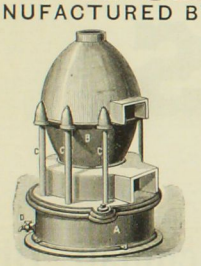

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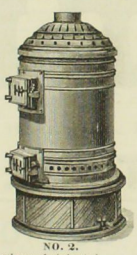

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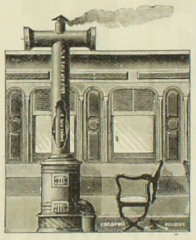
No. 3.—Designed for conducting hot air along the floor of passenger cars, and discharging it into the register equally throughout the entire length of the car, thus heating and *ventilating* the car perfectly.



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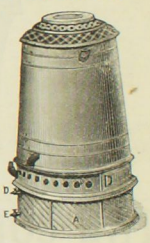

It has proved a great success as a heater, on account of the very large volume of air heated.
It also fills the great desideratum so long sought for, *perfect ventilation* during the summer by discharging a constant stream of cold air through the registers, keeping car free from dust and cinders.

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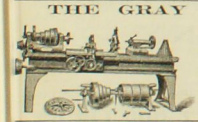

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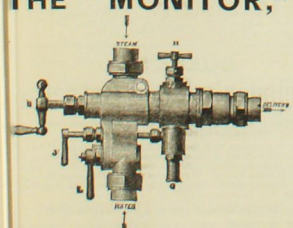

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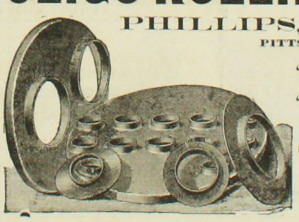

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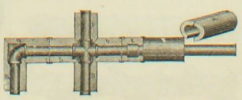

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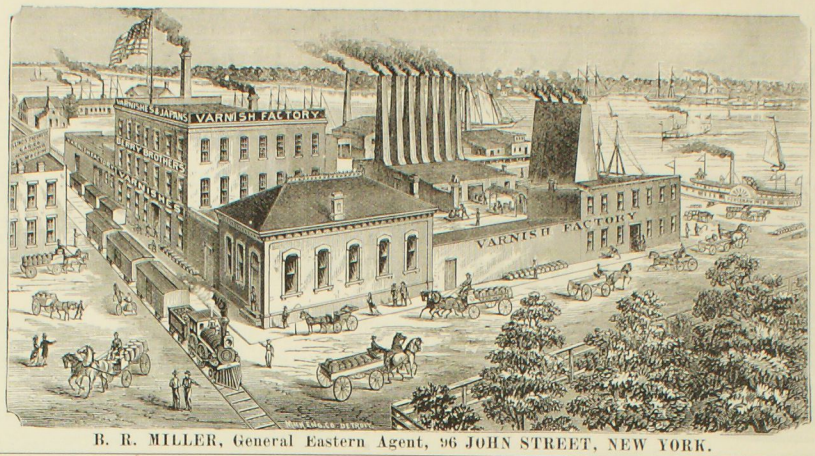

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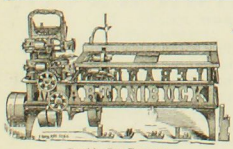
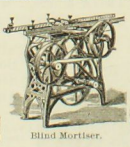
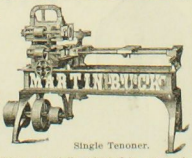


Double Car Tenoner.



Blind Mortiser.



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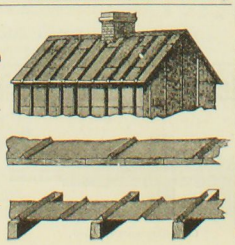

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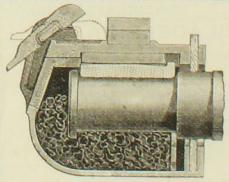

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We respectfully refer you to the following railroads using the Hewitt Cover:
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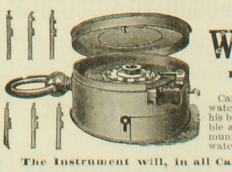

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Watchman's Time Detector

Important for all Large Corporations and Manufacturing Concerns.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with ordinary watch clocks.

The Instrument will, in all Cases, be Warranted Perfect and Satisfactory.

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DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 62 m. 3 lo. 62 cars.
C. E. Durkee, *Supt* ..... Saratoga, N. Y.
Jacob Myers, *M. M.* ..... Saratoga, N. Y.
Jas. J. Travers, *M. C. B.* ..... Saratoga, N. Y.
Alabama Great So'n R. R. *(See Cin., N. O. & T. P.)*
Albany & Susquehanna R. R. *(See D. & H. Canal Co.)*
Albert Ry. 4-8½ g. 51 m. 3 lo. 32 cars.
G. A. Robinson, *Manager* ..... Hillsboro, N. B.
Jas. McKay, *M. M. & C. B.* ..... Hillsboro, N. B.
Allegheny Valley R. R. 4-8 g. 250 m. 75 lo. 1959 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.) ..... Pittsburg, Pa.
A. A. Jackson, Supt. (L. G. Div.) ..... Brookville, Pa.
Geo. W. Glass, *M. M.* ..... Verona, Pa.
R. Gunning, *M. C. B.* ..... Verona, Pa.
Alliance & Lake Erie R. R. 3 g. 30 m. 3 lo. 112 cars.
W. E. Lewis, *Gen. Man.* ..... Alliance, O.
Anderson, Leb. & St. L. R. R. 4-9 g. 19 m. 2 lo. 20 c.
Ad. Larrecq, *Rec. & Supt.* ..... Anderson, Ind.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. B. Blanes, *Supt. & Pur. Agt.* ..... Annapolis, Md.
John L. Beall, *M. Mach.* ..... Annapolis, Md.
Arkansas Midland R. R. 3-6 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man.* ..... Helena, Ark.
J. B. Johnson, *M. M. & M. C. B.* ..... Helena, Ark.
Ashland Coal & Iron Ry. 4-8½ g. 14 m. 2 lo. 122 c.
W. F. Gaylord, *Gen. Supt.* ..... Ashland, Ky.
Ashtabula & Pittsburgh Ry. *(See Penna. Co.)*
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt.*, Spart'b'g, S. C.
M. Fraser, *M. M.* ..... Spartanburg, S. C.
W. B. Brown, *M. C. B.* ..... Spartanburg, S. C.
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 2,206 m. 157 lo. 5,373 cars.
C. C. Wheeler, *Gen. Man.* ..... Topeka, Kan.
W. S. Mellen, *Asst. Gen. Supt.* ..... Topeka, Kan.
D. J. Chase, *Gen. Supt.* ..... Topeka, Kan.
F. M. Smith, *Pur. Agt* ..... Topeka, Kan.
Geo. Hackney, *Supt. Lo. & Car. Dept* ..... do.
Eastern Div.: C. M. Rathbun, *Supt.* ..... Topeka, Kan.
C. Hackney, *M. M.* ..... Topeka, Kan.
Henry Hull, *G. F. Car Shop* ..... Topeka, Kan.
John Fagan, *M. M.* ..... Atchison, Kan.
J. M. Smith, *M. M.* ..... Kansas City, Mo.
W. W. Wheeler, *M. M.* ..... Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt.* ..... Nickerson, Kan.
E. H. Easterbrook, *M. M.* ..... Nickerson, Kan.
J. Q. Adams, *M. M.* ..... Dodge, Kan.
Col. Div.: W. W. Borst, *Supt.* ..... Pueblo, Col.
A. C. Stiles, *M. M.* ..... Pueblo, Col.
Las Vegas D.: T. J. Seeley, *Supt.* Las Vegas, N.M.
H. W. Somers, *M. M.* ..... Raton, N. M.
W. T. Allen, *M. M.* ..... Las Vegas, N. M.
Rio G. Div.: F. Leach, Jr., *Supt.* San Marcial, N.M.
M. C. Wheeler, *M. M.* ..... Wallace, N. M.
Atlanta & West Point R. R. *(See Western of Ala.)*
Atlantic, Gulf & West India Transit R. R. 5 g. 203 m.
D. E. Maxwell, *Gen. Supt.* ..... Fernadina, Fla.
Atlantic, Tenn. & Ohio R. R. 4-8½ g. 48 m. 3 lo. 26 c.
J. J. Gormley, *Supt.* ..... Charlotte, N. C.
Atlantic & Pacific R. R. 4-8½ g. 286 m.
F. W. Smith *Gen. Supt.* ..... Albuquerque, N. M.
B. W. Angell, *Div. Supt.* ..... Albuquerque, N. M.
Geo. Chalender, *Supt. M. P. & M.* ..... Chicago, Ill.
D. B. Sibley, *Pur. Agt.* ..... Chicago, Ill.
Augusta & Knoxville R. R. ..... 30 miles.
A. J. Twiggs, *Gen. Supt & M. M.* ..... Augusta, Ga.

B

Baltimore & Ohio R. R.
4-8½ g. 1,539 m. 546 lo. 14,862 cars.
N. S. Hill, *Pur. Agt.* ..... Baltimore, Md.
E. Ohio Riv. Div. ..... 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans.* ..... Baltimore, Md.
J. C. Davis, *Mast. of Mach.* ..... Baltimore, Md.
A. J. Cromwell, *Asst. M. of M.* ..... Baltimore, Md.
L. Packard, *M. C. B.* ..... Baltimore, Md.
I. N. Kalbaugh, *M. M.* ..... Baltimore, Md.
Wm. Edwards, *M. M.* ..... Martinsburgh, Va.
Sam. Houston, *M. M.* ..... Bedford, Pa.
Robert Maxwell, *M. M.* ..... Cumberland, Va.
S. B. Crawford, *M. M.* ..... Grafton, W. Va.
Alex. Laird, *M. M.* ..... Parkersburg, W. Va.
Chas. Hirsch, *M. M.* ..... Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt.* ..... Pittsburg, Pa.
J. E. Sinnett, *M. of Mach.* ..... Connellsville, Pa.
Trans-Ohio Divs.: B. Dunham, *G. Man.* ..... Newark, O.
W. H. Harrison, *Mast. of Mach.* ..... Newark, O.
E. L. Weisgerber, *M. M.* ..... Newark, O.
H. M. Ingler, *M. M.* ..... Bellaire, O.
O. B. Perkins, *M. M.* ..... Zanesville, O.
Andrew Beckert, *M. M.* ..... Sandusky, O.
F. J. Gunther, *M. M.* ..... Chicago Junction, O.
Chi. Div.: John Thomas, *Supt.* ..... Chicago, Ill.
Benj. Lowther, *M. M.* ..... Garrett, Ind.
W. C. Wilkinson, *M. M.* ..... Garrett, Ind.
Baltimore & Potomac R. R. *(See Penna. R. R.)*
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt.* ..... Bangor, Me.
C. S. Nason, *M. M.* ..... Bangor, Me.
Barclay R. R. 4-8½ g. 16 miles.
J. B. Judd, *Supt.* ..... Towanda, Pa.
Bath & Hammondsport R. R. 3 g. 9 m. 1 lo. 15 cars.
M. H. Hall, *Supt.* ..... Hammondsport, N. Y.
Allen Wood, *M. M.* ..... Hammondsport, N. Y.
Bedford, Springville, Owensburg & Bloomfield Ry.
3 g. 41 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M.* ..... Bedford, Ind.
Richard G. Elliott, *M. C. B.* ..... Bedford, Ind.
Bellaire & South-Western Ry. Co. 3 g. 42 m. 3 lo. 40 c.
S. J. Cochren, *Gen. Man.* ..... Bellaire, O.
Bell's Gap R. R. 3 g. 23 m. 2 lo. 35 cars.
R. G. Ford, *Supt.* ..... Bellwood (P. O.), Pa.
Belt R. R. 4-8½ g. 12 m. 10 lo.
M. A. Downing, *Gen. Man* ..... Indianapolis, Ind.
Bennington & Rutland Ry. 4-8½ g. 9 m. 1 lo. 214 c.
F. C. White, *Supt. & Pur. Agt.* ..... Bennington, Vt.
G. W. Blanchard, *M. M.* ..... Rutland, Vt.
Bodie Lumber Co. 3 g. 32 miles.
Thomas Holt, *Supt.* ..... Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. W. Witter, *Supt. & Pur. Agt* Worcester, Mass.
Chas. F. Brigham, *M. M.* ..... Worcester, Mass.
Boston, Concord, Montreal & White Mts. R. R.
4-8½ g. 107 m. 31 lo. 677 cars.
James A. Dodge, *Gen. Man.* ..... Plymouth, N. H.
W. A. Stowell, *Asst. Supt.* ..... Boston, Mass.
Thos. Vose, *Pur. Agt.* ..... Boston, Mass.
R. Adams, *M. M.* ..... Lake Village, N. H.
L. D. Pickering, *M. C. B.* ..... Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 39 m. 8 lo. 1980 cars.
W. L. Burt, *Pres. & Gen. Man.* ..... Boston, Mass.
J. L. Wellington, *Gen. Supt.* Mechanicville, N. Y.
Boston, Revere & Concord R. R.
4-8½ g. 338 m. 110 lo. 2,211 cars.
H. C. Sherburne, *Gen. Man.* ..... Boston, Mass.
Jas. S. Lauder, *Supt. Roll. Stock* ..... Boston, Mass.
F. H. Nourse, *Pur. Agt.* ..... Boston, Mass.
Boston & Lowell Div.:
J. F. Crocker, *M. Trans.* ..... Boston, Mass.
S. A. Davis, *M. M. & C. B.* ..... Nashua, N. H.
Concord Divs.:
R. E. Chamberlain, *Supt.* ..... Concord, N. H.
J. T. Gordon, *M. M. & C. B.* ..... Concord, N. H.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 5 lo. 46 c.
E. H. Whorf, *Supt & Pur. Agt.* ..... Boston, Mass.
J. L. Folsom, *M. M.* ..... Boston, Mass.
John Coghlan, *M. C. B.* ..... Boston, Mass.
Boston, Winthrop & Pt. Shirley. 3 g. 2½ m. 1 lo. 8 c.
C. A. Parks, *Pres. & Man.* ..... Boston, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 248 lo. 5,945 c.
C. O. Russell, *Gen. Supt.* ..... Springfield, Mass.
W. H. Barnes, *Asst. Supt.* ..... Boston, Mass.
A. B. Underhill, *Supt. M. P.* ..... Springfield, Mass.
F. D. Adams, *M. C. B.* ..... Allston, Mass.
W. H. Russell, *Div. Supt.* ..... Albany, N. Y.
Horace Eddy, *For. M. Sh.* ..... Springfield, Mass.
J. B. Weston, *For. C. Sh.* ..... Springfield, Mass.
G. H. Colby, *For. M. Sh.* ..... Boston, Mass.
H. B. Purvis, *For. M. Sh.* ..... Greenbush, N. Y.
J. E. Doran, *For. C. Sh.* ..... Greenbush, N. Y.
Boston & Maine R. R. 4-8½ g. 206 m. 84 lo. 1,112 c.
J. T. Furber, *Gen. Supt.* ..... Boston, Mass.
Wm. Smith, *M. M.* ..... Boston, Mass.
D. C. Richardson, *M. C. B.* ..... Lawrence, Mass.
Boston & N. Y. Air Line. 4-8½ g. 53 m. 9 lo. 156 c.
Jos. H. Franklin, *Supt.* ..... New Haven, Conn.
Boston & Providence R. R. 4-8½ g. 67 m. 47 lo. 866 c.
A. A. Folsom, *Gen. Supt.* ..... Boston, Mass.
Geo. Richards, *M. M.* ..... Roxbury, Mass.
Jno. Lightner, *M. C. B.* ..... Roxbury, Mass.
Bowling Green R. R. 4-8½ g. 5 m. 2 lo. 32 cars.
W. A. Wiggin, *Gen. Man.* ..... Bowling Green, O.
H. B. Higgins, *Supt. & M. M* Bowling Green, O.
Bradford R. R. ..... *(See Olean, B. & W.)*
Bradford, Bordell & Kinzua R. R. 3 g. 18 m. 5 lo. 78 c.
B. C. Williams, *Supt. & Pur. Agt.*, Bradford, Pa.
John Delaney, *M. M. & C. B* ..... Bradford, Pa.
Bradford, Eldred & Cuba R. R. ..... *(See Rich. & D.)*
C. D. Williams, *Supt. & P. A.*, Wellesville, N. Y.
Breakwater & Frankford R. R. *(See Junc. & Break.)*
Brightling Ry. 4-8½ g. 21 m. 1 lo. 44 cars.
A. Cary, *Gen. Man.* ..... Winterpock, Va.
Brooklyn, Bath & Coney Is. 4-8½ g. 7 m. 6 lo. 33 c.
Geo. A. Gunther, *Gen. Man.* ..... Brooklyn, N. Y.
B'klyn, Flatbush & Coney Is. 4-8½ g. 7½ m. 7 lo. 52 c.
Robert White, *Supt.* ..... Brooklyn, N. Y.
Brooklyn & Rockaway Beh. 4-8½ g. 3½ m. 3 lo. 18 c.
Wm. Warner, *Supt.* ..... E. New York, N. Y.
Brunswick & Albany R. R. 5 g. 172 m. 13 lo. 170 c.
R. J. Meador, *Supt.* ..... Brunswick, Ga.
Bucksport & Bangor R. R. 3 g. 18 m. 2 lo. 35 cars.
L. L. Lincoln, *Supt.* ..... Bucksport, Me.
Buffalo, N. Y. & Philla. Ry. 4-8½ g. 121 m. 34 lo. 2,436 c.
Geo. S. Gatchell, *Gen. Supt.* ..... Buffalo, N. Y.
J. H. Poole, *Pur. Agt.* ..... Buffalo, N. Y.
Allen Vail, *M. M. & C. B.* ..... Buffalo, N. Y.
Buff., Pittsburgh & W'n R. R. 4-9 g. 165 m. 331. 506 c.
Oliver Watson, Jr., *Gen. Supt.* ..... Oil City, Pa.
E. B. Wall, *Asst. Gen. Supt.* ..... Buffalo, N. Y.
H. J. Bookhammer, *M. M.* ..... Oil City, Pa.
John Monks, *M. C. B.* ..... Oil City, Pa.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 644 m. 62 lo. 2,120 cars.
C. J. Ives, *Gen. Supt.* ..... Cedar Rapids, Ia.
Robt. Williams, *Supt.* ..... Cedar Rapids, Ia.
T. Stickney, *Pur. Agt.* ..... Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B.* Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 36 m. 3 lo. 61 c.
D. C. Lindley, *Gen. Man.* ..... Burlington, Ia.
F. G. Brownell, *M. M.* ..... Burlington, Ia.
Burlington & North-River R. R. (in Neb.) *(See C., R. & Q.)*
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 85 c.
John T. Gerry, *Supt.* ..... Burlington, Ia.
Burlington & Southwestern Ry. 4-8½ g. 185 m.
J. W. Smith, *Supt.* ..... Burlington, Ia.
A. B. Allen, *M. C. B.* ..... Farmington, Ia.

C

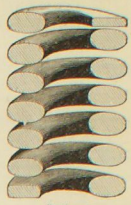
Cairo & St. Louis R. R. 3 g. 146 m. 22 lo. 708 cars
Chas. Hamilton, *Gen. Supt.* ..... St. Louis, Mo.
R. M. Pringle, *M. M.* ..... East Carondelet, Ill.
Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 294 c.
F. A. Hall, *Supt & Pur. Agt.* ..... Camden, N. J.
Rufus Hill, *M. M.* ..... Camden, N. J.
Samuel Wills, *M. C. B.* ..... Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 80 l. 3,397 c.
W. F. Taylor, *Gen. Man.* ..... Buffalo, N. Y.
A. F. Howland, *Pur. Agt.* ..... St. Thomas, Ont.
W. A. Short, *Gen. M. M.* ..... St. Thomas, Ont.
John Orrton, *Asst. M. C. B.* ..... St. Thomas, Ont.
Can. Div.: W. E. Carroll, *Supt.* ..... St. Thomas, Ont.
Robert Potts, *M. C. B.* ..... St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt.* ..... Toledo, O.
O. P. Dunbar, *M. M.* ..... Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
Eastern Div. ..... 340 m. 10 lo. 270 cars.
A. Baker, *Gen. Supt.* ..... Ottawa, Ont.
T. Irwin, *M. M.* ..... Brockville, Ont.
T. Blackwell, *Mech. Supt.* ..... Brockville, Ont.
Western Div. ..... 311 m. 10 lo. 207 cars.
A. B. Stickney, *Gen. Supt.* ..... Winnipeg, Man.
W. R. Baker, *Pur. Agt.* ..... Winnipeg, Man.
Cape Fr'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
L. C. Jones, *Gen. Supt.* ..... Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B.* Fayetteville, N. C.
Carolina Cen. R.R. 4-8½ g. 242 m. 24 lo. 456 cars.
V. Q. Johnson, *Gen. Supt.* ..... Wilmington, N. C.
C. H. Roberts, *Pur. Agt.* ..... Wilmington, N. C.
James Magleun, *M. of Mach.* Laurinburg, N. C.
S. R. Ethridge, *M. C. B.* ..... Laurinburg, N. C.
Carrollton & Greenville Ry. 5-6 g. 13 m. 4 lo. 13 cars.
R. W. Shepherd, Jr., *Asst. Man.* ..... Quebec, Can.
Carson & Colorado R. R. 3 g. 123 m.
H. M. Yerington, *Gen. Supt.* ..... Carson City, Nev.
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt & P. A.* Catasauqua, Pa.
Thos. E. Evans, *M. M.* ..... Catasauqua, Pa.
Chas. J. Richards, *M. C. B.* ..... Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
5 g. 975 m. 127 lo. 1,779 cars.
W. G. Raoul, *Gen. Supt. & G. Man.* Savannah, Ga.
Wm. Rogers, *Gen. Supt.* ..... Savannah, Ga.
Henry Yonge, *Pur. Agt.* ..... Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M.* ..... Savannah, Ga.
R. M. Barthelmess, *M. C. B.* ..... Savannah, Ga.
So.-West'n Div.: W. F. Shellman, *Supt* Macon, Ga.
D. M. Gugel, *M. M.* ..... Macon, Ga.
James A. Knight, *M. C. B.* ..... Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c
Joseph S. Harris, *Gen. Man.* ..... New York, N. Y.
B. W. Burnett, *Pur. Agt.* ..... New York, N. Y.
James Moore, *Gen. Supt.* ..... Elizabeth, N. J.
Cen. Div.: W. W. Stearns, *Ass't Gen. Supt.* ..... Elizabeth, N. J.
Wm. Woodcock, *M. M.* ..... Elizabeth, N. J.
Geo. Hackett, *M. C. B.* ..... Elizabeth, N. J.
N. J. So. Div.: R. Blodgett, *Ass't G. S.* Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *A. G. Supt* Mauch Chunk, Pa.
L. C. Brastow, *M. M. & C. B.* ..... Ashley, Pa.
Central Iowa Ry. 4-8½ g. 191 m. 37 lo. 1,487 cars.
D. N. Pickering, *Gen. Supt.* ..... Marshalltown, Ia.
John Pingree, *M. M.* ..... Marshalltown, Ia.
T. L. Seevers, *M. C. B.* ..... Marshalltown, Ia.
Central Pac. R. R. 4-8½ g. 2,777 m. 296 lo. 7,277 c.
A. N. Towne, *Gen. Supt.* ..... San Francisco, Cal.
J. A. Fillmore, *G. Supt.* ..... San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt.* Sacramento, Cal.
J. A. Stevens, *Gen. M. M.* ..... Sacramento, Cal.
Benj. Wells, *Asst. M. C. B.* ..... Sacramento, Cal.
G. J. Turner, *M. C. B.* ..... Sacramento, Cal.
West'n; Visalia; Tulare Divs. and North'n R. R.
A. D. Wilbur, *Supt.* ..... Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.) ..... Oakland, Cal.
W. D. Ludlow, *M. C. B.* (W. Div.) Oakland, Cal.
S. J. Johnson, *M. M.* (T. Div.) ..... Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.) S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
R. H. Pratt, *Supt.* ..... Sacramento, Cal.
M. W. Cooley, *M. M.* ..... Sacramento, Cal.
Phil. Douglas, *For. Car Sh.* Sacramento, Cal.
Truckee Div. and Nevada Ry. Supt. Wadsworth, Nev.
Geo. Gregg, *M. M.* ..... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh.* Wadsworth, Nev.
Humb't Riv. & Mend. Div.: Wellington, *Supt* Carlin, Nev.
W. F. Smith, *M. M.* ..... Carlin, Nev.
J. C. Doughty, *For. Car Sh.* ..... Carlin, Nev.
Salt Lake Div.: C. Cadell, *Supt.* ..... Ogden, Utah.
James Lamb, *M. M.* ..... Terrace, Utah.
A. Sherburne, *For. Car Sh.* ..... Ogden, Utah.
Los Angeles and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt.* ..... Los Angeles, Cal.
James Velsir, *M. M.* ..... Los Angeles, Cal.
J. S. Young, *For. Car Sh.* ..... Los Angeles, Cal.
Arizona Div. (So. Pac.):
A. A. Bean, *Asst. Supt.* ..... Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Ass't Supt.* ..... El Paso, Texas.
Central Vermont R. R. 4-8½ g. 548 m. 132 lo. 2,522 c.
J. W. Hobart, *Gen. Supt.* ..... St. Albans, Vt.
J. M. Foss, *A. G. S. & S. of M. P. & M.* St. Albans, Vt
No. Div.: J. B. Futvoye, *Supt.* ..... St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt.* ..... Rutland, Vt.
N. L. Davis, *M. M. & C. B.* ..... Rutland, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
G. W. Bentley, *G. Supt. & P. A.* New London, Ct.
I. W. Dow, *M. M.* ..... New London, Ct.
S. O. Banks, *M. C. B.* ..... New London, Ct.
Chagrin Falls & Southern R. R. 3 g. 6 miles.
J. W. Williams, *Supt.* ..... Chagrin Falls, O
Charleston & Savannah Ry. 5 g. 108 m.
C. S. Gadsden, *Gen. Supt.* ..... Charleston, S. C.
H. A. Ulmo, *M. M.* ..... Charleston, S. C.
J. D. Murphy, *M. C. B.* ..... Charleston, S. C.
Charlotte, Columbia & Augusta R. R. *(See Rich. & D.)*
Chateaugay R. R. 3 g. 34 m. 6 lo. 125 cars.
F. N. Corbin, *Supt.* ..... Plattsburg, N. Y.
Chatham Branch R. R. 4-8½ g. 9 m. 1 lo. 9 cars.
J. B. Snowball, *Manager* ..... Chatham, N. B.
Chattarol Ry. 4-8½ g. 43 miles.
C. H. Rockwell, *Gen. Man.* ..... Ashland, Ky.
A. T. Daniel, *M. M.* ..... Ashland, Ky.
Joseph Burley, *M. C. B.* ..... Ashland, Ky.
Cheraw & Chesterfield R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt.* ..... Chester, S. C.
Cheraw & Darlington R. R. *(See Wil. & Wel.)*
Cheraw & Salisbury R. R. ..... *(See Rich. & D.)*
Cherokee R. R. 3 g. 37 m. 5 lo. 50 cars.
John Postel, *Manager* ..... Atlanta, Ga.
C. E. Schen, *M. M. & C. B.* ..... Cedartown, Ga.
Chesapeake & Ohio Ry. 4-8½ g. 437 m. 80 l. 3,111 c.
C. W. Smith, *Gen. Man.* ..... Richmond, Va.
A. S. Emmons, *Pur. Agt.* ..... Richmond, Va.
John McFarland, *Supt. M. P. & M.* Richmond, Va.
T. L. Chapman, *A. S. M. P. & M.* Richmond, Va.
Eastern Div.: E. D. Smith, *Supt.* ..... Richmond, Va.
J. N. King, *M. C. B.* ..... Richmond, Va.
W'n Div.: W. P. Harris, *Supt* Huntington, W. Va.
H. C. Reader, *Supt. M. P. & M.* ..... Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt.* Lexington, Ky.
Chesapeake, Ohio & So.-W'n. 5 g. 112 m. 8 lo. 102 c.
S. Monsarrat, *Gen. Man.* ..... Paducah, Ky.
G. M. Taylor, *M. M.* ..... Paducah, Ky.
Cheshire R. R. 4-8½ g. 80 m. 30 lo. 499 cars.
R. Stewart, *Gen. Man.* ..... Keene, N. H.
H. H. Stone, *Pur. Agt.* ..... Keene, N. H.
F. A. Perry, *M. M.* ..... Keene, N. H.
A. E. Howard, *M. C. B.* ..... Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt* ..... Yorkville, S. C.
T. P. Beard, *M. M.* ..... Yorkville, S. C.
Chicago, Burlington & Quincy R. R.
4-8½ g. 2,873 m. 441 lo. 16,499 cars.
T. J. Potter, *Gen. Man.* ..... Chicago, Ill.
H. B. Stone, *Supt. Lo. & Car Dept.* ..... Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv. 1,938 miles.
H. B. Stone, *Gen. Supt.* ..... Chicago, Ill.
Wm. Irving, *Pur. Agt.* ..... Chicago, Ill.
Ill. Divs.: J. D. Besler, *Supt.* ..... Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt.* ..... Aurora, Ill.
L. E. Johnson, *M. M.* ..... Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt* Galesburg, Ill.
Robert Colville, *M. M.* ..... Galesburg, Ill.
St. L. Div.: W. R. Crumpton, *Supt* St. Louis, Mo.
A. Forsyth, *M. M.* ..... Beardstown, Ill.
Ia. & Mo. Divs.: K. H. Wade, *Supt.* Burlington, Ia.
East. Div.: C. M. Levy, *Supt.* ..... Burlington, Ia.
Joel West, *M. M.* ..... Burlington, Ia.
Mid. Div.: D. T. Ba-on, *Supt.* ..... Ottumwa, Ia.
West'n Div.: W. T. Ryder, *Supt.* ..... Creston, Ia.
C. W. Eckerson, *M. M.* ..... Creston, Ia.
(2) C., B. & Q., West of Mo. Riv. 935 miles.
G. W. Holdredge, *Gen. Supt.* ..... Omaha, Neb.
Geo. Hargreaves, *Pur. Agt.* ..... Omaha, Neb.
D. Hawksworth, *Gen. M. M.* Plattsmouth, Neb.
Bur. & Mo. Riv. in Neb. Ry. Divs.:
J. B. Phillippi, *Supt* ..... Lincoln, Neb.
C. Newton, *M. M.* ..... Lincoln, Neb.
R. W. Ure, *Asst. Supt. Hastings Div.* ..... Hastings, Neb.
A. & N. Div.: J. McConniff, *Supt.* ..... Lincoln, Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 1,951 m. 425 lo. 13,659 cars.
S. S. Merrill, *Gen. Man.* ..... Milwaukee, Wis.
W. C. Van Horne, *Gen. Supt.* ..... Milwaukee, Wis.
H. T. Crocker, *Pur. Agt.* ..... Milwaukee, Wis.
J. M. Lowry, *Gen. M. M.* ..... Milwaukee, Wis.
Lines East of Mississippi River:
E. Q. Sewell, *A. Gen. Supt.* ..... Milwaukee, Wis.
La Crosse; Pr. du Chien; Wis. Val.; Chi.; and Chi. & Pac. Divs.:
H. C. Akins, *Supt.* ..... Milwaukee, Wis.
John Baille, *M. C. B.* ..... Milwaukee, Wis.
Northern Div.: L. B. Rock, *Supt.* ..... Milwaukee, Wis.
Wm. H. Eldredge, *M. C. B.* ..... Milwaukee, Wis.
So.-Wn. Divs.: D. A. Olin, *Supt.* ..... Racine, Wis.
John Taylor, *M. M.* ..... Racine, Wis.
E. A. Eddy, *M. C. B.* ..... Racine, Wis.
Lines West of Mississippi River:
C. H. Prior, *A. G. Supt.* ..... Minneapolis, Minn.
N. Minn. Divs.: J. O. Pattie, *M. M.* Minn'ap'l's, Minn
So. Minn. Div.: J. M. Egan, *Supt.* ..... La Crosse, Wis.
Ia. & Dak.; Sioux City & Dak. Divs.:
G. W. Sanborn, *Supt.* ..... Mason City, Ia.
F. H. Moulton, *M. M.* (S. C. Div.) Yankton, Dak.
M. Pt. Div.: G. W. Cobb, *Supt.* ..... Mineral Pt., Wis.
Dubuque Div.: J. R. Jenkins, *Supt.* ..... Dubuque, Ia.
E. Smedley, *M. M.* ..... Dubuque, Ia.
Chicago, Pekin & So.-Wn. R.R. 4-8½ g. 88 m. 8 lo. 455 c.
J. Murray, *Supt. & Pur. Agt.* ..... Streator, Ill.
A. H. Cook, *Pur. Agt.* ..... Chicago, Ill.
A. R. Overton, *M. M.* ..... Joliet, Ill.
F. Shields, *M. C. B.* ..... Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 290 lo. 17,799 cars.
R. R. Cable, *V. P. & Gen. Man.* ..... Chicago, Ill.
A. Kimball, *Gen. Supt.* ..... Davenport, Ia.
F. A. Marsh, *Pur. Agt.* ..... Chicago, Ill.
T. B. Twombly, *Gen. M. M.* ..... Chicago, Ill.
B. K. Verbryck, *Gen. M. M.* ..... Rock Island, Ill.
Ill. Div.: R. H. Chamberlin, *Supt.* ..... Chicago, Ill.
R. Biester, *M. M.* ..... Chicago, Ill.
Sam'l Pullman, *M. C. B.* ..... Chicago, Ill.
Ia. Div.: H. F. Royce, *Supt.* ..... Des Moines, Ia.
J. G. Crockett, *M. M.* ..... Stuart, Ia.
Jas. E. Morrill, *M. M.* ..... Davenport, Ia.
Chas. M. Leonard, *M. C. B.* ..... Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt.* ..... Trenton, Ia.
R. A. Carscallin, *M. M.* ..... Trenton, Ia.
Chas. R. Best, *M. C. B.* ..... Trenton, Ia.
K. & Des. Mo. Div.: Jno. Given, *Supt.* ..... Keokuk, Ia.
S. W. Wakefield, *M. M.* ..... Keokuk, Ia.
Henry Kuster, *M. C. B.* ..... Keokuk, Ia.
Chi., Saginaw & Can. R. R. 4-8½ g. 38 m. 4 lo. 61 c.
Jas. T. Hall, *Supt.* ..... St. Louis, Mich.
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man.* ..... New Orleans, La.
L. T. Brown, *Asst Gen. Man.* ..... Jackson, Tenn.
J. C. Fe-tiger, Jr., *Pur. Agt.* ..... New Orleans, La.
W. H. Purdy, *Supt. Mech.* ..... McComb City, Miss.
Geo. W. Baxter, *M. C. B.* ..... McComb City, Miss.
So. Div.: W. P. McKinley, *Supt.* McComb City, Miss.
E. D. Anderson, *M. M.* ..... McComb City, Miss.
No. Div.: J. F. Nash, *Supt.* ..... Jackson, Tenn.
J. M. Keith, *M. M.* ..... Jackson, Tenn.
J. F. White, *M. M.* ..... Water Valley, Miss.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 863 m. 31 lo. 619 cars.
C. F. Hatch, *Gen. Supt.* ..... St. Paul, Minn.
W. H. S. Wright, *Pur. Agt.* ..... St. Paul, Minn.
Mat. Ellis, *M. M.* ..... St. Paul, Minn.
W. B. Rice, *M. C. B.* ..... St. Paul, Minn.
Ea. & No. Div.: H. Spencer, *Supt* St. Paul, Minn.
St. Paul Div.: C. F. Lincoln, *Supt.* ..... St. Paul, Minn.
Sioux City Div.: T. P. Gere, *Supt.* Sioux City, Ia.
F. W. Heintselman, *Gen. For. Sh.* Sioux City, Ia.
Neb. Div.: G. V. Morford, *Supt.* ..... Omaha, Neb.
Chicago, Texas & Mexican Central Ry. 52 miles.
J. T. Odell, *Gen. Supt.* ..... Dallas, Tex.
Chicago & Alton R. R. 4-8½ g. 840 m. 207 lo. 5,504 c.
J. C. McMullin, *Gen. Man.* ..... Chicago, Ill.
C. H. Chappell, *G. S. & A. G. M.* ..... Chicago, Ill.
A. V. Hartwell, *Pur. Agt.* ..... Chicago, Ill.
Wm. Wilson, *Supt. M. P. & M.* Bloomington, Ill.
Wm. Townsend, *M. C. B.* ..... Bloomington, Ill.
A. M. Richards, *Supt.* ..... Bloomington, Ill.
T. M. Bates, *Supt.* ..... Roodhouse, Ill.
O. Vaughan, *Supt.* ..... Slater, Mo.
Chicago & Block Coal Ry. 4-9 g. 15 m.
A. F. Beach, *Gen. Man.* ..... Veedersburg, Ind.
Chi. & East'n Ill. 4-8½ g. 248 m. 56 lo. 3,000 cars.
O. S. Lyford, *Gen. Supt. & Pur. Agt.* Chicago, Ill.
P. W. Drew, *M. Trans.* ..... Chicago, Ill.
Allen Cook, *M. M.* ..... Danville, Ill.
Jas. T. Kerney, *M. C. B.* ..... Danville, Ill.
Chicago & Grand Trunk Ry. *(See Grand Trunk.)*
Chicago & Indianapolis Air Line. 3 g. 67 m.
T. H. Hiner, *Manager* ..... Delphi, Ind.
Chicago & Iowa R. R. 4-8½ g. 104 m. 15 lo. 237 cars.
W. H. Holcomb, *Rec.* ..... Rochelle, Ill.
H. S. Bryan, *M. M.* ..... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 2,088 m. 476 lo. 16,673 cars.
Marvin Hughitt, *Gen. Supt. & Trs. & G. M.* Chicago, Ill.
J. D. Layng, *Gen. Supt.* ..... Chicago, Ill.
R. W. Hamer, *Pur. Agt.* ..... Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
J. M. Boon, *A. S. and M. P. & M.* W. Chicago, Ill.

CLIFF BUFFER.
5⅛ by 8. 2¼ in. hole.
Capacity, 16,500 lbs.

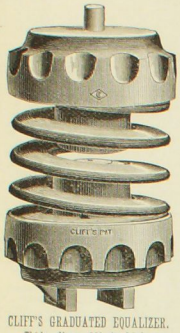
CLIFF, RIGHTER & CO.,

MANUFACTURERS OF

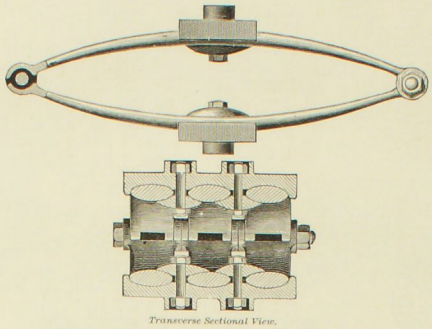
Railway Car Springs,



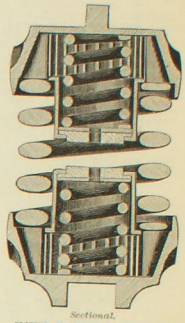
Sectional.
CLIFF BUFFER.
5⅛ x 8. 2¼ in. hole.
Capacity, 16,500 lbs.



CLIFF'S GRADUATED EQUALIZER.
7⅛ in. diam., 11⅛ in. high.
Capacity graduated from 7,000 to 10,000 lbs.



Transverse Sectional View.
ACME TRIPLET FREIGHT ELLIPTIC.
CLIFF'S PATENT, MARCH 29, 1881.
22 in. long. 6¼ in. bearing to bearing.
Capacity, 28,500 lbs.



Sectional.
CLIFF'S GRADUATED EQUALIZER.
7⅛ in. diam., 11⅛ in. high.
Capacity graduated from 7,000 to 10,000 lbs.

No. 5 DEY STREET, NEW YORK.

IN THE PATENT FICHT

BETWEEN

D. A. HOPKINS, of 113 Liberty Street, N. Y.,

PATENTEE AND MANUFACTURER OF

SELF-FITTING JOURNAL BEARINGS,

AND

T. V. LE ROY,

A SECOND DECISION WAS RENDERED JUNE 7, 1881,

IN FAVOR OF HOPKINS.

The closing paragraphs of said decision read as follows:

"As the proofs stand, therefore, Hopkins was the first to conceive, the first to disclose to others, the first to embody in models, the first to reduce to practice, and the first to apply for a patent. Le Roy was first to obtain a patent, but under circumstances which do not give him the prima facie case which a patent usually implies."

"We must find priority of invention to be with D. A. Hopkins, and affirm the examiner's decision."

H. H. BATES,
R. L. B. CLARKE,
R. G. DYRENFORTH,
Examiners-in-Chief.

WILSON, WALKER & CO.,
MANUFACTURERS OF ALL KINDS OF
RAILROAD CAR AND LOCOMOTIVE FORGINGS,
PITTSBURGH, PA.

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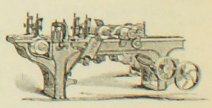
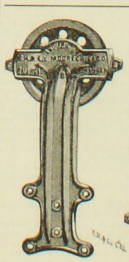
BLIND SHADE
Planing Machine
FOR
CAR WORK.
The most perfect Machine in use.

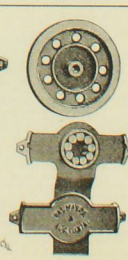
LEE'S PATENT
Molding Machines



Five different styles and sizes. These are especially adapted to all classes of car work.

HENRY A. LEE, Manuf'r, 104 Union St., Worcester, Mass.





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BAGGAGE-CAR DOORS,
FREIGHT-CAR DOORS,
STREET-CAR DOORS, ETC.
Send for Price List, Illustrated.
MANUFACTURED BY
S. H. & E. Y. MOORE,
163 & 165 LAKE STREET, CHICAGO.

Danville, Olney & O. Riv. R. R. 3 g. 110 m. 4 lo. 83 c.
J. M. Graham, *Supt*.....Kansas, Ill.
Louis Partsce, *M. M.*.....Kansas, Ill.
Dayton & Union R. R. 4-10 g. 47 m. 3 lo. 55 cars.
C. C. Gale, *Supt*.....Indianapolis, Ind.
H. S. Gordon, *M. M.*.....Dayton, O.
Delaware, Lackawanna & Western R. R.
4-8½ g. 703 m. 348 lo. 20,187 cars.
Wm. F. Halstead, *Gen. Supt.*...Scranton, Pa.
G. W. H. Cushing, *Pur. Agt.*...New York, N. Y.
Walter Dawson, *Mast. of Mach.*..Scranton, Pa.
Robt. McKenna, *Mast. Car Rep.*..Scranton, Pa.
Bloomsburg Div.: C. Graham, *M. M.*..Kingston, Pa.
Utica Div.: Thos. Thatcher, *M. M.*...Utica, N. Y.
Morris & Essex Div. and Sussex R. R.:
A. Reasoner, *Supt*.....Hoboken, N. J.
W. H. Lewis, *M. M.*.....Kingsland, N. J.
J. W. Baker, *M. C. B.*.....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*.....Oswego, N. Y.
Jas. Buchanan, *M. M.*.....Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 30 lo. 598 cars.
W. K. Niver, *Gen. Supt*.....Syracuse, N. Y.
Jas. Buchanan, *M. M.*.....Syracuse, N. Y.
Delaware River R. R. 4-9 g. 20 m.
E. H. Green, *Supt*.....Woodbury, N. J.
Delaware Western R. R. 4-8½ g. 20 m. 4 lo. 30 cars.
David Connell, *Supt*.....Wilmington, Del.
Delaware & Chesapeake R. R. 4-8½ g. 54 m. 3 lo. 16 c.
C. S. Sanford, *Supt*.....Oxford, Md.
Joseph A. Hayward, *M. M.*.....Des Moines, Ia.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 506 m. 151 lo. 9,348 cars.
C. F. Young, *Gen. Man.*.....Honesdale, Pa.
C. F. Young, *Pur. Agt.*.....Albany, N. Y.
R. C. Blackall, *Supt. of Mach.*.....Albany, N. Y.
Susq. Div.: C. D. Hammond, *Supt.*...Albany, N. Y.
C. A. Jones, *M. M.*.....Oneonta, N. Y.
J. R. Skinner, *M. C. B.*.....Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt.*...Troy, N. Y.
J. L. Corey, *M. M.*.....Green Island, N. Y.
Chr. Körner, *M. C. B.*.....Green Island, N. Y.
Pa. Div.: R. Manville, *Supt. & Pur. Agt.*; R. Manville, Scranton, Pa.
S. H. Dotterer, *M. M.*.....Carbondale, Pa.
T. Orchard, *M. C. B.*.....Carbondale, Pa.
Denver & Rio Grande R'y 3 g. 1,247 m. 181 lo. 7,758 c.
D. C. Dodge, *Gen. Man.*.....Denver, Col.
A. B. Garner, *Pur. Agt.*,Colorado Springs, Col.
G. W. Cushing, *Gen. Supt*.....Denver, Col.
Mast. M. C. Kimberly, *Supt. 1st Div.*, S. Pueblo, Col.
2d Div.: W. H. Bancroft, *Supt. 2d Div.*, Alamosa, Col.
N. W. Sample, *M. M.*.....Denver, Col.
San Juan Div.: R. M. Ridgeway, S. Ouray, Col.
Des Moines & Ft. Dodge. 4-8½ g. 87 m. 9 lo. 153 c.
C. N. Gilmore, *Supt*.....Des Moines, Ia.
John McGrayel, *M. M.*.....Grand Junction, Ia.
E. A. Avery, *M. C. B.*.....Grand Junction, Ia.
Det., Gr. H. & Mil. Ry. 4-8½ g. 180 m. 36 lo. 478 c.
John Barton, *Asst. Man.*.....Detroit, Mich.
John S. Lorimer, *Storekeeper*.....Detroit, Mich.
W. J. Morgan, *Supt*.....Detroit, Mich.
F. Parker, *M. M.*.....Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 34 lo. 1027 c
John B. Mulliken, *Gen. Man.*.....Detroit, Mich.
Allan Bourn, *Pur. Agt.*.....Detroit, Mich.
Thos. M. Fish, *Gen. Supt.*.....Ionia, Mich.
G. G. Watrous, *M. M. & C. B.*.....Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 8 lo. 227 c.
Thos. McKeown, *Gen. Supt.*...Marquette, Mich.
E. W. Allen, *Pur. Agt*.....Marquette, Mich.
John Wilson, *M. M.*.....Marquette, Mich.
Dorchester & Delaware R. R. 4-8½ g. 33 m.
Thos. E. Wright, *Supt*.....Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*.....Waverly, Ia.
W. S. Couch, *Pur. Agt*.....Dubuque, Ia.
Duck River Valley R. R. .....102 cars.
Geo. Childress, *Supt*.....Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 4 lo. 102 cars. 54 c.
D. Thayer, *Gen. Supt*.....Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*.....New York, N. Y.
J. C. Haggett, *M. M. & C. B.*.....Dunkirk, N. Y.

E

East Alabama Ry. 5 g. 22 m. 3 lo. 12 cars.
W. W. Barnes, *Supt*.....Opelika, Ala.
East Broad Top R. R. 3 g. 30 m. 6 lo. 191 cars.
John Sims, *Supt*.....Orbisonia, Pa.
G. A. Haggerty, *M. M.*.....Orbisonia, Pa.
E. St. Louis & Carondelet Ry. 4-0 g. 12 m. 1 lo. 22 c.
Joseph Hill, *Gen. Supt.*.....East St. Louis, Mo.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 102 lo. 1,597 cars.
J. F. O'Brien, *Gen. Supt.*.....Knoxville, Tenn.
Main Stem: Ohio; and No. Car. Divs.:
F. K. Huger, *Supt*.....Knoxville, Tenn.
B. J. Sitton, *M. M.*.....Knoxville, Tenn.
Jas. Armbruister, *M. C. B.*.....Knoxville, Tenn.
Selma and Alabama Central Divs.:
John M. Bridges, *Supt*.....Selma, Ala.
Selma Gay, *M. M.*.....Selma, Ala.
W. W. Pierce, *M. C. B.*.....Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, *Jr., Supt*.....Memphis, Tenn.
H. N. Burford, *M. M.*.....Memphis, Tenn.
J. J. Casey, *M. C. B.*.....Memphis, Tenn.
Macon & Brunswick Div.:
J. M. Edwards, *Supt*.....Macon, Ga.
J. M. Armstrong, *Pur. Agt*.....Macon, Ga.
R. Wagnon, *M. M.*.....Macon, Ga.
East Tenn. & W'n No. Carolina R. R. 15 miles.
Thomas E. Watson, *Supt.*..Elizabethton, Tenn.
Eastern R. R. 4-8½ g. 58 m. 87 lo. 1,098 cars.
D. W. Sanborn, *Mast. of Trans.*..Boston, Mass.
Geo. J. Fisher, *Pur. Agt*.....Boston, Mass.
James Pilsbury, *S. M. P. & M.*..E. Boston, Mass.
J. D. Billings, *M. C. B.*.....Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt.*, Wolfboro J., N. H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 123 c.
H. W. Bates, *V. P. & Manager*..Riverton, Ky.
Geo. Gibbs, *Pur. Agt*.....Riverton, Ky.
D. S. Weaver, *M. M.*.....Riverton, Ky.
Eastern Ohio R. R. 4-8½ g. 8 m. 1 lo. 2 cars.
W. H. Stevens, *Gen. Supt.*...Cumberland, O.
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo.
W. Thompson, *Supt*.....Princess Anne, Md.
Elberton Air-Line R. R. 3 g. 50 m. 2 lo. 25 cars.
G. J. Foreacre, *Gen. Man. & P. A.*..Atlanta, Ga.
Elgin Ry. 14 miles.
C. E. Hallett, *Gen. Man.*.....Sussex, N. B.
Elizabeth City & Norfolk R. R. 4-8½ g. 70 m. 5 lo. 96 c.
M. K. King, *Gen. Man. & Pur. Agt.*..Norfolk, Va.
J. S. Whitworth, *M. M. & C. B.*.....Norfolk, Va.
Erie & Pittsburgh R. R. (*See Penna. Co.*)
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 124 cars.
P. Everts, *Gen. Supt*.....Eureka, Nev.
J. M. Alson, *M. M. & C. B.*.....Eureka, Nev.
Eureka & No. Amer. Ry. 4-8½ g. 114 m. 3 lo. 60 c.
F. W. Cram, *Supt. & Pur. Agt*.....Bangor, Me.
A. O. Bailey, *M. M. & C. B.*..Mattawamkeag, Me.
Evansville, Paducah & Cairo Line. 200 miles.
G. J. Grammer, *Supt*.....Evansville, Ind.
Evansville, Rockport & En'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, *Supt*.....Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 114 m. 6 lo. 378 c.
C. J. Hepburn, *Gen. Supt*.....Evansville, Ind.
J. L. White, *M. M. & Pur. Agt*..Evansville, Ind.

F

Fitchburg R. R. 4-8½ g. 180 m. 100 lo. 3,315 cars.
John Adams, *Gen. Supt*.....Boston, Mass.
E. R. Turner, *Asst. Supt*.....Fitchburg, Mass.
F. S. Pratt, *Pur. Agt*.....Boston, Mass.
W. S. Foster, *Acting Supt. M. P. & M.*; and
J. W. Marden, *M. C. B.*..Charlestown, Mass.
Flint & Pere Marq. 4-8½ g. 318 m. 52 lo. 1,556 cars.
H. C. Potter, *Gen. Man.*.....E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man.*..E. Saginaw, Mich.
G. G. Cook, *Pur. Agt*.....E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt.*..E. Saginaw, Mich.
W. F. Potter, *Supt.* (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt* (W. Div.)E. Saginaw, Mich.
T. J. Hatswell, *M. M.*.....E. Saginaw, Mich.
B. McPherson, *M. C. B.*.....E. Saginaw, Mich.
Florida Central R. R. 5 n. 50 m.
Wm. M. Davidson, *Supt. & P. A.*..Jacksonville, Fla.
Jas. S. McElroy, *M. M. & C. B.*..Jacksonville, Fla.
Florida Southern Ry. 3 g. 50 miles.
N. R. Gruelle, *Gen. Supt*.....Palatka, Fla.
F. A. Garrison, *Pur. Agt*.....Palatka, Fla.
B. L. Baldwin, *M. M. & C. B.*.....Palatka, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 20 m. 5 lo. 18 c.
Lawton Caten, *Supt.*.....Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A.*Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. 4-8½ g.
G. R. Pearson, *Supt*.....Fort Dodge, Ia.
S. R. Kenrick, *Supt. & Pur. Agt.*Ft. Madison, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 12 m. 1 lo. 21 c.
Ft. Wayne, Muncie & Cin. 4-8½ g. 108 m. 9 lo. 249 c.
W. W. Worthington, *Gen. Supt.*Ft. Wayne, Ind.
Ft. Wayne & Jackson. 4-8½ g. 100 m. 10 lo. 353 c.
Gen. Supt. & P. A......Jackson, Mich.
C. W. Hollister *M. M. & C. B.*..Jackson, Mich.
Fredericton Ry. 4-8½ g. 22 m. 2 lo. 22 cars.
F. B. Edgecomb, *Supt*.....Fredericton, N. B.
Freehold & Jamesburg R. R. 4-9 g. 15 m. 3 lo. 40 c.
J. E. Ralph, *Supt.*; *P. A. & M. M.* Keyport, N. J.
Chas. H. Snedeker, *M. C. B.*.....Freehold, N. J.
Fulton County R. R. 3 g. 20 miles.
S. H. Mallory, *Gen. Manager*.....Lewiston, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 348 m. 26 lo. 620 cars.
Jas. Converse, *Gen. Supt*.....Houston, Tex.
Chas. Babbidge, *Pur. Agt*.....Boston, Mass.
D. T. Davis, *Supt. M. P. & M.*..Harrisburg, Tex.
James Alexander, *M. C. B.*...Harrisburg, Tex.
El Paso Div. 4-8½ g. 54 m.
Galveston, Houston & Henderson R. R.
4-8½ g. 60 m. 17 lo. 212 cars.
W. H. Harding, *Gen. Man.*.....Galveston, Tex.
Allen McCoy, *Supt*.....Galveston, Tex.
J. G. Conlon, *M. M.*.....Galveston, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
Georgia R. R. 5 g. 307 m. 42 lo. 958 cars.
John W. Green, *Gen. Man.*.....Augusta, Ga.
S. K. Johnson, *Supt*.....Augusta, Ga.
John S. Cook, *M. M.*.....Augusta, Ga.
T. M. Purse, *M. C. B.*.....Augusta, Ga.
Grand Haven R. R. 3 g. 20 miles. (*See Chic. & W. Mich.*)
Grand Junction R'y. (*See Midland of Can.*)
G'd Rapids & Indiana R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 456 m. 40 lo. 1,596 c.
W. O. Hughart, *Pres.*.....Grand Rapids, Mich.
W. K. Boyd, *Pur. Agt*.....Grand Rapids, Mich.
S. D. Bradley, *M. M.*.....Fort Wayne, Ind.
No'n Div.: J. M. Metheany, *Supt.* G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt.* Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 53 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A.* Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B.*.....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 1,267 m. 434 lo. 9,403 c.
Joseph Hickson, *Gen. Man.*.....Montreal, Can.
Wm. Wainright, *Asst. Gen. Man.*Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, *Supt.* Montreal, Can.
Jno. Taylor, *Gen. Storekeeper.*Montreal, Can.
Herbert Wallis, *Mech. Supt.*..Montreal, Can.
Wm. McWood, *M. C. B.*.....Montreal, Can.
F. R. F. Brown, *Asst. M. S.*....Montreal, Can.
J. Davis Barnett, *Asst. M. S.*..Stratford, Ont.
Chi. & Gr. Trunk R'y. 4-8½ g. 330 m. 50 lo. 1,191 c.
S. R. Callaway, *Gen. Man.*.....Chicago, Ill.
N. Wall, *Pur. Agt*.....Fort Gratiot, Mich.
H. Roberts, *Mech. Supt.*..Fort Huron, Mich.
Great Western Ry. 4-8½ g. 823 m. 216 lo. 5,039 c.
F. Brought'n, *Gen. Man.*.....Hamilton, Ont.
Chas. Rutt, *Supt*.....Hamilton, Ont.
G. R. Nash, *Storekeeper*.....London, Ont.
C. K. Domville, *Loco. Supt*.....Hamilton, Ont.
C. F. Hanson, *M. M.*.....London, Ont.
Henry Childs, *M. C. B.*.....London, Ont.
Green Bay, Winona & St. Paul R. R.
4-8½ g. 218 m. lo. 599 cars.
Timothy Case, *V. P., Gen. Man.*Green Bay, Wis.
James S. Mott, *Pur. Agt*.....Green Bay, Wis.
Edw. Osborne, *M. M.*.....Green Bay, Wis.
Greenville, Col. & Birmingham. 3 g. 43 m. 2 lo. 44 c.
C. M. Bolton, *Gen. Man.*.....Greenville, Miss.
Greenwich & Johnsonville Ry. 4-8½ g. 15 miles.
J. H. Thompson, *Supt*.....Greenwich, N. Y.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 303 m. 15 lo. 430 c.
John Sealy, *Gen. Man.*.....Galveston, Texas.
F. P. Killen, *Asst. Gen. Man. & Pur. Agt.*...do.
G. B. Nichols, *M. M.*.....Galveston, Texas.
W. H. Martin, *M. C. B.*.....Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. lo. 70 c.
M. D. Monserratte, *Pr. & Supt*.....Cuero, Texas.
James Mooney, *M. M.*.....Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 70 m. 5 lo. 237 c.
H. Abbott, *Manager*.....New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 202 m. 78 lo. 1,860 c.
John B. Carson, *Gen. Man.*.....Hannibal, Mo.
W. R. Woodard, *Supt*.....Hannibal, Mo.
T. L. Dunn, *Ch. Eng. & Pur. Agt.*Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep.*Hannibal, Mo.
Hanover Branch Ry. 4-8½ g. 8 m. 2 lo. 76 cars.
E. Y. Perry, *Pres.*.....So. Hanover, Mass.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 7 m. 0 lo. 106 cars.
H. A. Young, *Gen. Supt*.....Hanover, Pa.
John J. Bingley, *M. M.*.....Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 27 m. 3 lo. 7 c.
J. H. Middleton, *Supt*.....Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 45 m. 7 lo. 196 c.
Samuel Babcock, *Pur. & Supt.*...Hartford, Ct.
Hartford & Conn. W. R. R. 4-8½ g. 60 m. 10 lo. 235 c.
John F. Jones, *Supt*.....Hartford, Ct.
J. C. Barton, *M. M.*.....Hartford, Ct.
Hartwell R. R. 3 g. 10 m. 1 lo. 3 cars.
E. B. Benson, *Supt*.....Hartwell, Ga.
Housatonic R. R. 4-8½ g. 126 m. 22 lo. 405 cars.
L. B. Stillman, *Supt*.....Bridgeport, Ct.
D. S. Draper, *Pur. Agt*.....Bridgeport, Ct.
N. Slingland, *M. M.*.....Falls Village, Ct.
J. J. Ferris, *M. C. B.*.....Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 50 miles.
S. L. Werden, *V. P. & Gen. Man.*Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 88 m. 9 lo. 254 c.
E. L. Bremond, *Gen. Man.*.....Houston, Tex.
Paul Bremond, *Pur. Agt*.....Houston, Tex.
Houston & Tex. Cen. R. R. 4-8½ g. 621 m. 60 lo. 1,945 c.
G. Jordan, *V. Pr. & Gen. Man.*...Houston, Tex.
A. H. Swanson, *Gen. Supt*.....Houston, Tex.
E. S. Larcher, *Pur. Agt*.....New York, N. Y.
M. G. Howe, *Supt*.....Houston, Tex.
Geo. A. Quinlan, *Supt*.....Corsicana, Tex.
Donald Allen, *Supt*.....Waco, Tex.
L. C. Noble, *M. M.*.....Houston, Tex.
James McGee, *M. C. B.*.....Houston, Tex.
Huntingdon & W. Top Mt. R. R. 4-8½ g. 62 m. 3 lo. 60 c.
Geo. F. Gage, *Gen. Supt.*.....Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt.*..Philadelphia, Pa.
William Barkla, *M. M.*.....Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,320 m. 294 lo. 5,952 c
E. T. Jeffery, *Gen. Supt*.....Chicago, Ill.
C. A. Beck, *Asst. Gen. Supt*.....Chicago, Ill.
O. Ohl, *Pur. Agt*.....Chicago, Ill.
S. J. Hayes, *Supt. of Mach*.....Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.
Chic. Div.: T. L. Hudson, *Supt*.....Cairo, Ill.
Henry Schlacks, *M. M.*.....Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt.*.....Pontiac, Ill.
Spring Div.: W. Wilkinson, *Supt.* Springfield, Ill.
W. B. McKenna, *M. M.*.....Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*.....Amboy, Ill.
J. B. Edame, *M. M.*.....Amboy, Ill.
Ia. Div.: S. W. Parker, *Supt*.....Dubuque, Ia.
Thos. W. Place, *M. M.*.....Waterloo, Ia.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
L. Genia, *Rec. & Gen. Man.*..Terre Haute, Ind.
E. D. Frost, *Gen. Supt*.....Terre Haute, Ind.
J. G. Clifford, *M. M.*.....Terre Haute, Ind.
Illinois & St. Louis R. R. 4-8½ g. 18 m. 5 lo. 467 c.
C. H. Sharman, *Gen. Supt. & P. A.* Belleville, Ill.
E. Hockett, *M. M.*.....Belleville, Ill.
Charles Rotha, *M. C. B.*.....E. St. Louis Mo.
Indiana, Bloomington & Western Ry.
4-8½ g. 673 m. 97 lo. 3,451 cars.
C. E. Henderson, *Gen. Man.*..Indianapolis, Ind.
H. C. Norton, *Pur. Agt*.....Indianapolis, Ind.
E. Hiscrodt, *M. M. & C. B.*.....Urbana, Ill.
I. D. & S. Div.: F. L. Peck, *Act. Supt.* Indianpls, Ind.
P. Leeds, *Supt. Mo. Po.*.....Indianapolis, Ind.
Ohio Div.: D. W. C. Brown, *Supt*.....Sandusky, O.
Jos. S. Porter, *M. M.*.....Sandusky, O.
Ohio So'n Rd.: Ford Woods, *Supt.*..Springfield, O.
G. A. Barnes, *Pur. Agt*.....Springfield, O.
Indianapolis & St. Louis R. R. (*See Ohio Ry.*)
Indianapolis & Vincennes R. R. (*See Penna. Co.*)
Intercolonial Ry. 4-8½ g. 846 m. 111 lo. 3,223 cars.
David Pottinger, *Chief Supt.*...Moncton, N. B.
T. V. Cooke, *Gen. Storekeeper*..Moncton, N. B.
H. A. Whitney, *Mech. Supt*.....Moncton, N. B.
Ewd. Shaffer, *M. M. & C. B.*.....Moncton, N. B.
Monc. Div.: James E. Price, *Supt.* Moncton, N. B.
Hal. & St. J. Div.: Jas. Coleman, *Supt.* Truro, N. S.
No'n Div.: W. Busby, *Supt*.....Campbellton, N. B.
Levis Div.: M. McDonald, *Supt.* Riviere du Loup, Q.
International Ry. 4-8½ g. 69 m. 2 lo. 12 cars.
International & Gt. N'n R. R. (*See St. J. & L. R.*)
D. E. McFee, *Supt*.....Sherbrooke, Que.
Iowa Eastern R. R. 3 g. 19 m. 1 lo. 32 cars.
H. H. Kerr, *Supt*.....Belmont, Ia.
Iron R. R. 4-10 g. 16 m. 5 lo. 187 cars.
Charles Campbell, *Pr*.....Ironton, O.
Perry Scott, *M. M.*.....Ironton, O.
Clem. Roetling, *M. C. B.*.....Ironton, O.
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 lo. 11 c.
Wm. Bailey, *Pres. & Gen. Man.*...Helena, Ark.
D. Stillinger, *Supt*.....Helena, Ark.
F. M. Green, *Pur. Agt*.....Helena, Ark.
Ithaca, Auburn & Western R. R. 4-8½ g. 38 m.
Fred T. Peet, *Supt*.....Auburn, N. Y.

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 68 c.
E. S. Greenleaf, *Supt*.....Jacksonville, Ill.
Ira Petrie, *M. M.*.....Jacksonville, Ill.
Jacksonv., Pensacola & Mob. 5 g. 175 m. 11 lo. 102 c.
J. P. Laird, *Supt. & M. M.*.....Tallahassee, Fla.
Jamesville & Washington. 4-8½ g. 22 m. 3 lo. 24 c.
A. Fisher, *Man.*.....Dymond City, N. C.
Jefferson'l, Madison & Indpls. R. R. (*See Ry. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Man.*.....Jersey City, N. J.
Junction & Breakwater; Breakwater & Frankford and Worcester R. Rs. 4-8½ g. 101 m. 6 l. 133 c.
J. & B. Rd.: Thos. Groome, *Supt*.....Lewes, Del.
J. A. Maguire, *M. M.*.....Lewes, Del.
B. & F. and W. Rds.: J. L. Mapes, *Sr.* Berlin, Md.

K

Kansas Central R. R. 3 g. 150 m.
W. A. Martin, *Supt. & Pur. Agt.*; and
Wm. McCall, *M. M.*.....Leavenworth, Kan.
Kansas City, Fort Scott & Gulf R. R.; and
Kansas City, Lawrence & Southern Kansas R. Rs.
4-8½ g. 729 m. 62 lo. 1,700 cars.
Geo. H. Nettleton, *Gen. Man.*..Kansas City, Mo.
L. W. Towne, *Gen. Supt*.....Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.....Kansas City, Mo.
J. L. Barnes, *Supt*.....Kansas City, Mo.
J. S. McCrum, *M. M.*.....Kansas City, Mo.
A. N. Montier, *M. C. B.*.....Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ g. 308m. 38 lo. 1,148 cars.
J. F. Barnard, *Gen. Supt. & P. A.*..St. Joseph, Mo.
F. A. Chase, *M. M.*.....St. Joseph, Mo.
Thos. Aylesbury, *M. C. B.*.....St. Joseph, Mo.
Kendall & Fifield R. R. 4-8½ g. 148 m. 19 lo. 371 cars.
J. D. Ellison, *Gen. Man.*.....Covington, Ky.
J. R. Ledyard, *Supt*.....Covington, Ky.
J. H. Setchel, *M. M. & Asst. Supt.*Covington, Ky.
J. L. Hackathorn, *M. C. B.*.....Covington, Ky.
Kinzua R. R. (*See Olean, B. & W.*)
Kingston & Pembroke Ry. 4-8½ g. 65 m. 4 lo. 76 c.
B. W. Folger, *Supt*.....Kingston, Can.
Wm. Harty, *Pur. Agt*.....Kingston, Can.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 36 cars.
C. A. Coombs, *Supt*.....Bath, Me.
Wm. A. Field, *M. M.*.....Bath, Me.
C. L. Turner, *M. C. B.*.....Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 lo. 54 cars.
J. M. Hood, *Supt*.....Marysville, Tenn.

L

Lake Erie & Western Ry. 4-8½ g. 362 m. 35 l. 1,526 c.
E. H. Waldron, *Gen. Man.*.....La Fayette, Ind.
E. H. Andress, *Pur. Agt*.....La Fayette, Ind.
H. L. Cooper, *Supt. of Equipment*.....Lima, O.
Sandusky Div.: D. S. Hill, *Supt.*.....Fremont, O.
Bloom. Div.: J. B. Clark, *Supt.*..La Fayette, Ind.
Lake George & Muskegon Riv. 4-8½ g. 21 m. 4 lo. 75 c.
W. S. Gerrish, *Gen. Man.*.....Muskegon, Mich.
Lake Ontario So'n Ry. 4-8½ g. 34 m. 3 lo. 40 cars.
Jas. E. Briggs, *Gen. Man.*.....Newark, N. Y.
Geo. Thompson, *M. M.*.....Sodus Point, N. Y.
Wm. Curner, *M. C. B.*.....Sodus Point, N. Y.
Lake Shore & Michigan. So'n Ry.
4-8½ g. 1,243 m. 496 lo. 13,665 cars.
John Newell, *Gen. Man.*.....Chicago, Ill.
P. P. Wright, *Gen. Supt*.....Cleveland, O.
A. C. Armstrong, *Pur. Agt*.....Cleveland, O.
James Seddon, *Gen. Supt.*.....Cleveland, O.
John Kirby, *Gen. M. C. B.*.....Cleveland, O.
Buffalo Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M.*.....Buffalo, N. Y.
A. C. Robson, *M. C. B.*.....Buffalo, N. Y.
Frank Div.: G. H. McIntire, *Supt.* Stoneboro, Pa.
Erie Div.: C. B. Couch, *Supt*.....Cleveland, O.
L. O. Gassett, *M. M.*.....Cleveland, O.
J. Withycombe, *M. C. B.*.....Cleveland, O.
Toledo Div.: Thos. Fleeher, Jr., *Supt.* Cleveland, O.
J. M. Sanborn, *M. M.*.....Norwalk, O.
W. O. Smith, *M. C. B.*.....Norwalk, O.
Mich. Div.: J. E. Curtis, *Supt*.....Toledo, O.
Det. Div.: T. J. Charlesworth, *Supt.* Detroit, Mich.
Lansing Div.: W. H. Canuff, *Supt.*, Lansing, Mich.
Western Div.: W. H. Barnes, *Supt*.....Chicago, Ill.
G. W. Stevens, *M. M.* (M.S. Divs.) Elkhart, Ind.
Frank O. Bray, *M. C. B.*.....Adrian, Mich.
Laurel Fork and Sand Hill R. R. 4-8½ g. 7 m. 2 lo. c.
D. C. Mudge, *Supt*.....Parkersburg, W. Va.
Lebanon Springs R. R. 4-8½ g.
John Cayne, *Manager*.....Albany, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 315 lo. 31,047 c.
Robt. H. Sayre, *Gen. Supt.*.....Bethlehem, Pa.
H. S. Goodwin, *Asst. Gen. Supt.*Bethlehem, Pa.
L. Chamberlain, *Pur. Agt*.....Philadelphia, Pa.
John S. Lentz, *M. C. B.*.....Packerton, Pa.
N. J. Div.: John I. Kinsey, *M. M.*.....Easton, Pa.
Coal Rds.: J. I. Blakeslee, *Supt.* Manch Chunk, Pa.
P. Hofecker, *M. M.*.....Weatherly, Pa.
John Campbell, *M. M.*.....Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.* Manch Chunk, Pa.
D. Clark, *M. M.*.....Hazleton, Pa.
Wy. Div.: E. Mitchell, *S. & M. M.* Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Supt*.....Sayre, Pa.
J. N. Weaver, *M. M.*.....Waverley, Pa.
Levis & Kennebec Ry. 4-8½ g. 145 m.
Robert Smith, *Manager*.....Levis, Quebec.
Ligonier Valley R. R. 3 g. 11 m. 2 lo. 29 cars.
Thos. A. Mellon, *Gen. Manager*.Latrobe, Pa.
Little Rock, Miss. River & Texas Ry.
4-8½ g. 190 m. 12 lo. 160 cars.
J. A. Wodson, *Gen. Supt.*.....Little Rock, Ark.
F. F. Hufsmith, *M. M.*.....Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 168 m. 12 lo. 107 c.
T. Hartman, *Gen. Supt.*.....Little Rock, Ark.
James Ehlin, *M. M.*.....Argenta, Ark.
James Malone, *M. C. B.*.....Argenta, Ark.
Long Island R. R. 4-8½ g. 325 m. 74 l. 623 cars.
I. D. Barton, *Supt.*.....Long Island City, N. Y.
Benj. Norton, *Pur. Agt.* Long Island City, N. Y.
C. A. Thompson, *M. M. & C. B.*.....do.
Long View & Sabine Val. Ry. 3 g. 12 m. 1 lo. 10 cars.
B. Barner, *Pr. & Gen. Supt.*...Long View, Tex.
Louisiana Western R. R. (*See Tex. & N. O.*

Louisville, New Albany & Chicago Ry.
4-8½ g. 289 miles 33 lo. 2,800 cars.
John MacLeod, *Gen. Supt*.....Louisville, Ky.
Wm. M. Lewis, *Gen. Agt*.....Louisville, Ky.
Josiah Bettis, *M. M. & C. B.*...New Albany, Ind.
Louis. N. Albany & St. L. Ry. 4-8½ g. 45 m. 2 lo. 20 c.
St. J. Boyle, *V. Pr. & Gen. Man.*Louisville, Ky.
R. G. Butler, *Gen. Supt*.....Louisville, Ky.
C. F. Martin, *Pur. Agt*.....Louisville, Ky.
F. M. Mast, *M. M.*.....Louisville, Ky.
Louisville & Nashville R. R.
5 g. 2,073 m. 316 lo. 6,131 cars.
Fred. de Funiak, *Gen. Man.*.....Louisville, Ky.
G. C. Breed, *A. Gen. Man. & Pur. Agt.* do.
D. W. C. Rowland, *Gen. Supt. Trans.* do.
Reuben Wells, *Supt. Mach.*.....Louisville, Ky.
Louisv. Divs.; and Louisv. Cin. & Lex. Ry. (Cin. Div.)
J. G. Metcalf, *Supt*.....Louisville, Ky.
A. Middleton, *M. M.* (Lo. Div.)..Louisville, Ky.
J. W. Luttrell, *M. M.* (Cin. Div.) Louisville, Ky.
W. P. Pike, *M. M.* (2d & C. Div.) Bowling Green, Ky.
Nash. & D. Div.: J. Geddes, *Supt.* Nashville, Tenn.
W. H. Thomas, *M. M.*.....Nashville, Tenn.
S. & N. A. Div.: E. Marsh, *Supt.* Birmingham, Ala.
C. W. White, *M. M.*.....Birmingham, Ala.
Mob. & M. ; N. Div. Pens. & Sel.; St. & Mont. R. Rs.:
M. S. Belknap, *Supt*.....Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: J. T. Harrihan, *Supt.* New Orleans, La.
Wm. Adair, *M. M.*.....Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt.* Memphis, Tenn.
J. V. Slusser, *M. M.*.....Memphis, Tenn.
St. L. Div.: J. Montgomery, *Supt.* Evansville, Ind.
Thos. Walsh, *M. M.*.....Mt. vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Sanford, *Supt*.....Pensacola, Fla.
Louisville & Wadley R. R. 3 g. 10 m.
J. H. Wilkins, *Pr. & Supt*.....Louisville, Ga.

M

Maine Central R. R. 4-8½ g. 355 m. 57 lo. 1,237 c.
Payson Tucker, *Supt*.....Portland, Me.
Ira K. Russell, *For. Mach. Sh.*..Waterville, Me.
C. H. Kenison, *Pur. Agt*.....Augusta, Me.
Manchester &

Montpelier & Wells Riv. R. R. 4-8½ g. 38 m. 3 lo. 7 c
W. A. Stowell, *Supt*.....Montpe ter, Vt.
Montrose Ry.....3 g. 28 m. 2 lo. 3 cars.
J. I. Blakslee, *Supt*.....Mauch Chunk, Pa.
Morgan's Louisiana & Tex. (*See Tex. & N. O.*)
Mount Washington Ry.....3½ g. 4 lo. 6 pass. cars.
Walter Aiken, *Supt*.....Franklin Falls, N. H.
Muney Creek Ry.....4-8½ g. 10 m.
Benj. G. Welch, *Rec*.....Hughesville, Pa.

N

Nantasket Beach R. R. 4-8½ g. 3 m. 2 lo. 6 cars.
Nantucket R. R.....3 g. 3½ miles.
P. H. Folger, *Supt*.....Nantucket, Mass.
Narragansett Pier R. R. 4-8½ g. 8 m. 2 lo. 10 cars.
G. D. Lanphear, *Supt*.....Place Dale, R. I.
Nashua & Rochester R. R. (*See Wor. & Nash.*)
Nashville, Chattanooga & St. Louis R'y.....
5 g. 508 miles 87 lo. 1,521 cars.
F. de Funiak, *Gen. Man*.....Louisville, Ky.
J. W. Thomas, *Gen. Supt*.....Nashville, Tenn.
M. J. C. Wrenne, *Supt*.....Nashville, Tenn.
James Cullen, *M. M*.....Nashville, Tenn.
J. G. Sawyer, *M. C. B*.....Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3-6 g. 43 m. 3 lo. 11 c.
J. H. Fitzpatrick, *Supt*.....Natchez, Miss.
J. M. Bell, R. A. 4-8½ g. 61 miles, 12 lo. 334 cars.
Geo. W. Beach, *Supt*.....Waterbury, Ct.
Henry Hanford, *M. M*.....Bridgeport, Ct.
Geo. W. Gray, *M. C. B*.....Bridgeport, Ct.
Nevada Central R. R. (*See Union Pac.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
Thos. F. Kidder, *Supt*.....Grass Valley, Cal.
New Brunswick Ry. 4-8½ g. 194 m. 12 lo. 266 cars.
E. R. Burpee, *Supt*.....Gibson, N. B.
Alfred Seely, *Pur. Agt*.....Gibson, N. B.
Jesse Mathews, *M*.....Gibson, N. B.
T. N. Burpee, *M. C. B*.....Gibson, N. B.
New Brunswick & Can. Ry. 4-8½ g. 127 m. 10 lo. 184c.
Henry Osborn, *G. M. & P. A.* St. Andrew's, N. B.
John Stewart, *Supt*.....St. Stephen, N. B.
Chas. Armstrong, *M. M*.....St. Andrew's, N. B.
G. Houlton, *M. C. B*.....St. Andrew's, N. B.
New Canaan R. R. 4-8½ g. 8 m. 2 lo. 4 cars.
Wm. St. John, *Supt*.....New Canaan, Conn.
New Castle & Oil City R. R. 4-9 g. 58 m. 6 lo. 80 cars
A. Vandiwort, *Supt*.....New Castle, Pa.
New Haven & Derby R. R. 4-8½ g. 13 m. 3 lo. 38 c.
C. H. Quintard, *Supt*.....New Haven, Conn.
New Haven & No'mpton. 4-8½ g. 141 m. 21 lo. 510 c.
C. A. Goodnow, *Supt*.....New Haven, Ct.
C. N. Yeomans, *Pur. Agt*.....New Haven, Ct.
Henry Fox, *M. M*.....New Haven, Ct.
John Sweeny, *M. C. B*.....New Haven, Ct.
New Jersey & New York R. R. 6 g. 45 m. 6 lo. 40 c.
J. D. Hasbrouck, *Supt*.....Jersey City, N. J.
J. S. Drake, *M. M*.....Jersey City, N. J.
New Jersey Southern Ry.....(*See Central, N. J.*)
New London Northern R. R. (*See Central Pac.*)
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars.
H. S. Morse, *Supt*.....New Orleans, La.
New Orleans & Selma R. R. 5 g. 21 m. 1 lo. 9 cars.
N. Y. L. B. Scofield, *Supt*.....Selma, Ala.
Central & Hudson River R.R.
4-8½ g. 1,018 m. 630 lo. 19,995 cars.
J. M. Toucey, *Gen. Supt*.....New York, N. Y.
R. C. Moore, *Pur. Agt*.....New York, N. Y.
Wm. Buchanan, *Supt. M. P. & M*.....New York, N. Y.
L. Garey, *Gen M. C. B*.....New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt*.....do.
P. McG. Gibson, *M. M*.....New York, N. Y.
C. E. Garey, *M. C. B*.....Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt*.N. York, N. Y.
do.
.....New York, N. Y.
Peter Smith, *M. C. B*.....New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*.....Utica, N. Y.
G. B. Van Vorst, *M. M*.....West Albany, N. Y.
D. Hoit, *M. C. B*.....West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt*. Rochester, N. Y.
Amos Gould, *M. M*.....E. Buffalo, N. Y.
S. L. White, *M. M*.....Syracuse, N. Y.
E. A. Olmstead, *M. C. B*.....E. Buffalo, N. Y.
C. H. Burchard, *M. C. B*.....E. Rochester, N. Y.
Rid. Donaby, *M. C. B*.....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4-8½ g. 100 m. 19 lo. 700 c.
L. Williams, *Gen. Man*.....Cleveland, O.
Chas. Morrill, *Gen. Supt*.....Cleveland, O.
New York City & Northern. 4-8½ g. 52 m. 7 lo. 31 c.
F. S. Gannon, *Gen. Supt*.....High Bridge, N. Y.
M. McNally, *M. of M*.....High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4-8½ g. 1,010 m. 544 loco. 24,400 cars.
Robt. Harris, *V. Pr. & G. Man*. New York, N. Y.
E. S. Bowen, *Gen. Supt*.....New York, N. Y.
J. A. Hardenburg, *Pur. Agt*.....New York, N. Y.
F. M. Wilder, *Supt. M. P. & M*.....Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*.....Jersey City, N. J.
J. H. Vreeland, *M. M*.....Jersey City, N. J.
J. N. Mileham, *M. C. B*.....Jersey City, N. J.
Del. Div.: Chas. Neilson, *Supt*. Fort Jervis, N. Y.
J. Van Vechten, *M. M. & C. B*.Ft. Jervis, N. Y.
Susq. Div.: R. B. Cable, *Supt*.....Elmira, N. Y.
V. Blackburn, *M. M*.....Susquehanna, Pa.
D. B. Goodell, *M. C. B*.....Elmira, N. Y.
Buf. & B. Divs.: C. W. Gardner, *Acting Supt.*; and
G. B. Ross, *M. M*.....Buffalo, N. Y.
M. Wilder, *M. C. B*.....Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt*.....Buffalo.
W'n Div.: W. B. Coffin, *Supt*. Hornellsville, N. Y.
E. H. Griggs, *M. M*.....Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4-8½ g. 202 m. 97 lo. 1,951 cars.
E. M. Read, *V. P. & Gen. Supt*.....Hartford, Ct.
R. N. Dowd, *Pur. Agt*.....Hartford, Ct.
N. Y. & N. H. Div.: J. M. Moody, *Supt*. New York.
Shore Div.: W. H. Stevenson, *Supt*. N. Haven, Ct.
H. Kettendorf, *Supt. Mach*...New Haven, Ct.
Jas. Deuver, *M. C. B*.....New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt*.....Hartford, Ct.
John Henny, Jr., *Supt. Mach. & M. C. B*. do.
New York, Ontario & Western Ry.
4-8½ g. 345 m. 79 lo. 1,948 cars.
Jas. E. Childs, *Gen. Supt*.....Middletown, N. Y.
Cias. Clarke, *Pur. Agt*.....Middletown, N. Y.
Edw. Minshull, *M. M. & C. B*.Middletown, N. Y.
S'n'n Div.: A. H. Danforth, *Supt*. Middletown, N. Y.
Mid. Div.: N. R. Rankin, *Supt*. Middletown, N. Y.
No'n Div.: C. W. Lanpher, *Supt*...Norwich, N. Y.
New York & Pennsylvania & Ohio R. R.
4-8½ g. 558 m. 215 lo. 7,367 cars.
P. D. Cooper, *Gen. Man*.....Cleveland, Ohio.
J. M. Ferris, *Supt. Transp*.....Cleveland, Ohio.
J. H. Holway, *Pur. Agt*.....Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B*...Cleveland, O.
S. V. Smith, *Asst Gen. M. C. B*...Akron, Ohio.
E'n Div.: A. L. Dunbar, *Supt*.....Meadville, Pa.
J. A. Cooper, *M. M*.....Meadville, Pa.
D. S. Dockstader, *M. C. B*.....Meadville, Pa.
J. F. Fosdick, *For. Car Rep*.Salamanca, N. Y.
W'n Div.: J. W. Alsop, *Supt*.....Galion, O.
Wm Hill, *M. M*.....Galion, O.
J. W. Holmes, *For. Car Rep*.....Galion, O.
Geo. Wilson, *For. Car Rep*.....Dayton, Ohio.
Maho'g Div.: N. F. Wood, *Asst. Supt*.Cleveland, O.
E. Wright, *M. M*.....Cleveland, O.
C. N. Thorp, *Act. M. C. B*.....Cleveland, O.
New York, Providence & Boston R. R.
4-8½ g. 62 m. 27 lo. 357 cars.
J. B. Gardner, *Supt*.....Providence, R. I.
Giles F. Ward, *Pur. Agt*.....Stonington, Conn.
J. H. Manderson, *M. M. & C. B*.Providence, R. I.
N. Y., Susquehanna & W'n. 4-8½ g. 86 m. 30 lo. 242 c.
H. M. Britton, *Gen. M. & P. A*.New York, N. Y.
W. C. Ennis, *M. M. & C. B*...Wortendyke, N. J.
N. Y. & Brighton Beach Ry.....3 g. 3 miles.
Geo. Edw. Harding, *Gen. Supt*.New York, N. Y.
N. Y. Greenwood Lake R. R. 4-8½ g. 41 miles.
J. H. Tinney, *Acting Supt*.....Jersey City, N. J.
G. A. Hobart, *Pur. Agt*.....Jersey City, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo.
D. C. Corbin, *Man. Dir*.....New York, N. Y.
New York & New England R. R.
4-8½ g. 403 m. 127 lo. 3,326 cars.
Jas. H. Wilson, *Pres. & Gen. Man*.Boston, Mass.
W. W. McKim, *Pur. Agt*.....Boston, Mass.
S. M. Felton, Jr., *Gen. Man*.....Boston, Mass.
O. M. Shepard, *Supt. of Trans*...Boston, Mass.
Geo. E. Boyden, *Supt. M. P. & M*.Boston, Mass.
Elias E. Pratt, *M. C. B*.....Norwood, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
Richard Colburn, *M. M*.....Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*...Providence, R. I.
W'n Div.: J. C. Rawn, *Supt*.....Hartford, Ct.
E. M. Humstone, *M. M*.....Hartford, Ct.
Newburg, Duchess & Conn. R. R. 4-8½ g. 58 miles.
C. S. Kimball, *Gen. Supt*. Dutchess Junc., N. Y.
W. G. Vanbuskirk, *M. M*.. Dutchess Junc., N. Y.
Newport & Wickford R. R. 4-8½ g. 3 m. 1 lo. 4 cars.
Theo. Warren, *Supt*.....Newport, R. I.
Norfolk & Western R. R. 5 g. 428 m. 83 lo. 1,094 c.
Frank Huger, *Supt. Trans*.....Lynchburg, Va.
Henry Fink, *2d V. Pr. & Gen. Man*. Lynchb'g, Va.
J. P. Minetree, *Storekeeper*.....Petersburg, Va.
Va. & Tenn. Div.: F. Sterk, *M. M*. Lynchburg, Va.
W. A. Morgan, *M. C. B*.....Lynchburg, Va.
Nor. & Pt. Div.: N. M. Osborne, *Mast. Trans.*
J. T. Robinett, *M. M. & C. B*.Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, *Supt*.....Athens, Ga.
Jno. J. Longest, *M. C. B*.....Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*)
North Pacific Coast R. R. 3 g. 80 m. 12 lo. 310 cars.
David Nye, *Gen. Supt*.....San Rafael, Cal.
W. F. Russell, *Pur. Agt*.....San Francisco, Cal.
Jas. Wand, *M. M*.....Sancelito, Cal.
North-Western Ohio Ry. (*See Penna. Co.*)
Northern (N. H.), and Concord & Claremont Rys.
4-8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, *Supt*.....Concord, N. H.
Ed. Studley, *Supt. Roll. Stock*.....Concord, N. H.
Northern (N. J.) R. R. 3 g. 80 m. 12 lo. 310 cars.
(*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Pennsylvania R. R.*)
Northern Pacific R. R. 4-8½ g. 904 m. 104 lo. 3,089 c.
Herman Haupt, *Gen. Man*.....St. Paul, Minn.
E. T. Nichols, *Gen. Supt*.....St. Paul, Minn.
Geo. W. Cross, *Supt. Trans*.....St. Paul. Minn.
A. P. Farrar, *Supt. Mach*.....Brainerd, Minn.
St. P. & Pac. Div.: J. McHugh, *Supt.*, do.
Dakota Div.: C. T. Hobart, *Supt.*.....Fargo, Dak.
A. Rupert, *M. M*.....Fargo, Dak.
Mo. Riv.: Thos. Taylor, *Supt*.....Bismarck, Dak.
E. F. Dorau, *M. M*.....Bismarck, Dak.
Pacific Div.: J. W. Sprague, *Gen. Supt.*; and
Otis Nye, *Pur. Agt*.....New Tacoma, W. T.
C. Z. Sanders, *M. M*.....New Tacoma, W. T.
Thos. G. Davis, *M. C. B*..New Tacoma, W. T.
Northern & North-W'n Ry. 5-6 & 4-8½ g. 50 lo. 1,033 c.
James Webster, *Supt*.....Toronto, Can.
C. W. Postlethwaite, *Pur. Agt*....Toronto, Can.
P. Clarke, *M. M*.....Toronto, Can.

O

Ogd nsburg & Lake Champlain R. R.
4-8½ g. 122 m. 33 lo. 1,100 cars.
A. A. Gaddis, *Gen. Man*.....Malone, N. Y.
Abr. Klohs, *Supt. & M. M*.....Malone, N. Y.
Ohio Ry.....4-8½ g. 1,078 m. 302 lo. 9,538 cars.
J. H. Devereux, *Pres*.....Cleveland, O.
E. B. Thomas, *Gen. Man*.....Cleveland, O.
J. L. Yale, *Pur. Agt*.....Cleveland, O.
W. F. Turreff, *Gen. M. M*.....Cleveland.
(1) Cl., Col., Cin. & Ind. Divs. 471 m. 162 lo. 4,768 c.
Col. Cin. Div.: Robt. Bilee, *Supt*. Cleveland, O.
W. L. Gilmore, *M. M*.....Cleveland, O.
Ind'p'lis Div.: J. O. Ewan, *Supt*. Indianapolis, Ind.
W. C. Quigley, *M. M*.....Brightwood, Ind.
(2) Ind'p'lis & St. Louis R. R. 206 m. 56 lo. 2,276 c.
C. C. Gale, *Gen. Supt*.....Indianapolis, Ind.
T. W. Ransom, *M. M*.....Mattoon, Ill.
Geo. H. Pratt, *M. C. B*.....Mattoon, Ill.
(3) Cin., Ham. & Day. Divs. 341 m. 84 lo. 2,314 c.
J. H. Barrett, *Gen. Supt*.....Cincinnati, O.
C. R. & C. Div.: Robert Bewer, *M. M*. Richm'd, Ind.
Jas. Eckford, *M. M*.....Cincinnati, O.
W. H. H. Allison, *M. C. B*.....Cincinnati, O.
D. & M. Div.: Jas. Dwight, *Supt*.....Toledo, O.
Jno. Black, *M. M*.....Lima, Ohio.
Ohio Central R. R. 4-8½ g. 230 m. 30 lo. 3,201 cars.
G. G. Hadley, *Gen. Man*.....Toledo, O.
W. H. Vandegrift, *Supt*.....Toledo, O.
F. W. Stewart, *Pur. Agt*.....Toledo, O.
J. H. Brennan, *M. M. & C. B*.....Bucyrus, O.
Ohio Southern R. R. (*See Ind., Bl. & W.*)
Ohio & Mississippi Ry. 4-9 g. 615 m. 14 lo. 2,501 cars.
W. W. Peabody, *Gen. Supt*.....Cincinnati, O.
G. E. Atwood, *Pur. Agt*.....Cincinnati, O.
Cin. Div.: C. B. Cole, *Supt*.....Seymour, Ind.
John Thumser, *M. M*.....Seymour, Ind.
J. P. Coulter, *M. M*.....Aurora, Ind.
Arthur Donaldson, *M. M*.....Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt*. St. Louis, Mo.
J. P. Coulter, *M. M*. (Spring. Div.). Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt*.....Louisville, Ky.
Oil City & Ridgway R. R. 4-8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, *Gen. Man*.....Oil City, Pa.
Old Colony R. R. 4-8½ g. 463 m. 110 lo. 2,862 cars.
J. R. Kendrick, *Gen. Supt*.....Boston, Mass.
R. W. Hustead, *Pur. Agt*.....Boston, Mass.
J. K. Taylor, *M. M*.....Boston, Mass.
A. Gleason, *M. C. B*.....Boston, Mass.
Main Li. Div.: J. H. French, *Supt*.....Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*. Hyannis, Mass.
No. Div. : S. A. Webber, *Supt*.....Fitchburg, Mass
George W. Reynolds, *M. M*.....Taunton, Mass.
Sam. Stevens, *M. C. B*.....Taunton, Mass
Olean, Bradford & Warren; Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Wilcox, *Gen. Supt*.....Olean, N. Y.
J. H. Poole, *Pur. Agt*.....Buffalo, N. Y.
Charles Turner, *M. M. & C. B*.....Olean, N. Y.
Olympia & Chehalis R. R. 3 g. 15 miles.
William Mitchell, *Supt*.....Olympia, W. T.
Oregon Ry. & Nav. Co. 4-8½ g. 216 m. 19 lo. 493 cars.
C. H. Prescott, *Manager*.....Portland, Ore.
J. M. Buckley, *Asst. Man*.....Portland, Ore.
J. M. Drake, *Pur. Agt*.....Portland, Ore.
C. C. Hobart, *M. M*.....The Dalles, Ore.
Chas. Phipps, *M. C. B*.....The Dalles, Ore.
Oregon & California R. R. 4-8½ g. 200 m. 14 lo. 286 c.
R. Hoehler, *Act. Man*.....Portland, Ore.
J. Brandt, *Jr., Gen. Supt*.....Portland, Ore.
A. Brandt. *M. M*.....Portland, Ore.
Oregonian Ry. Co. 3 g.
Wm. Hoyt, *Gen. Man*.....Portland, Ore.
J. M. Fillmore, *Supt*.....Portland, Ore.
James Walch, *M. M*.....Portland, Ore.
Owensboro & Nashville R. R. 3 g. 35 m.
W. L. Gude, *Gen. Supt*.....Owensboro, Ky.

P

Paducah & Elizabeth R. R. 5 g. 186 m. 19 lo. 536 c.
Robert Bell, *Supt*.....Elizabethtown, Ky.
W. D. Robb, *M. M. & C. B*.Elizabethtown, Ky.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
J. A. Newcome, *Supt*.....Painesville, O.
J. H. Jones, *M. M*.....Painesville, O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, *Supt*.....Aspinwall, U. S. Col.
Thomas S. O'Brien, *M. M*.Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Brownson, *Supt*.....Parker City, Pa.
Philip Davies, *M. M*.....Parker City, Pa.
Wm. Wolford, *M. C. B*.....Parker City, Pa.
Passumpsic R. R. 4-8½ g. 165 m. 28 lo. 100 cars.
H. E. Folsom, *Supt*.....Lyndonville, Vt.
L. L. Brigham, *M. M*.....Lyndonville, Vt.
L. P. Woodard, *M. C. B*.....Lyndonville, Vt.
Paulding & Cecil Ry. 4-8½ g. 7 m. 2 lo. 14 cars.
S. Frank Eagle, *Pres*.....Cecil, O.
Paw Paw & Michigan R. R. 3 g. 13 m. 2 lo. 7 c.
J. Ihling, *Supt*.....Lawton, Mich.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
S. M. Mumford, *Supt. & Pur. Agt*.. York, Pa.
E. H. Williams, *M. C. B*.....York, Pa.
Peninsula R. R. (*See Wor. & Som.*)
Pennsylvania Co.'s (O) Roads.
4-9 g. 2,838 m. 817 lo. 29,432 cars.
D. W. Caldwell, *Gen. Man*.....Pittsburg, Pa.
W. A. Baldwin, *Man*.....Pittsburg, Pa.
Wm. Mullins, *Gen. Pur. Agt*.....Pittsburg, Pa.
Joseph Wood, *Supt. M. P.*.....Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4-9 g. 224 m. 97 lo. 3,936 c.
R. V. Smith, *Asst. Gen. Man*.....Cleveland, O.
John Thomas, *Supt*.....Cleveland, O.
N. E. Chapman, *Mast. of Mach*.Cleveland, O.
(2 & 3) Erie & Ashtabula Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, *Supt*.....Youngstown, O.
J. A. Wood, *For. Shops*.....Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 303 cars.
Jas. J. Turner, *Supt*.....Indianapolis, Ind.
M. M.....
(5) Jeffersonville, Madison & Indianapolis R. R.
4-9 g. 317 m. 47 lo. 784 cars.
E. W. McKenna, *Supt*.....Louisville, Ky.
Wm. Swanston, *M. M*.....Jeffersonville, Ind.
Edw. Austin, *M. C. B*.....Jeffersonville, Ind.
(6) Northwestern Ohio Ry.
J. S. Morris, *Supt*.....Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4-9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: A. B. Starr, *Supt*.....Allegheny, Pa.
Geo. J. Parkin, *M. M*.....Allegheny, Pa.
G. W. Lowe, *For. Shops*.....Crestline, O.
W'n Div.: C. D. Law, *Supt*.....Ft. Wayne, Ind.
F. D. Casanave, *M. M*.....Ft. Wayne, Ind.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4-9 g. 1,172 m. 336 lo. 6,482 cars.
Gen. Supt.....Pittsburg, Pa.
G. W. Rhodes, *Supt M. P. & M*.....Columbus, O.
P. & Col. Div.: E. B. Taylor, *Supt*. Dennison, O.
Ross Kells, *M. M*.....Dennison, O.
A. K. Mansfield, *M. C. B*.....Steubenville, O.
Robt. Curtis, *M. M*.....Columbus, O.
Thos. Chamberlain, *M. C. B*.....Columbus, O.
C. & M. Div.: W. F. Black, *Supt*. Zanesville, O.
Leroy Kells, *M. M*.....Lancaster, O.
Daniel Jewell, *M. C. B*.....Lancaster, O.
Li. Mi. Div.: Ralph Peters, *Supt*.....Cincinnati, O.
Leroy Kells, *M. M*.....Columbus, O.
M. P. Ford, *M. C. B*.....Columbus, O.
Log. Div.: E. F. Miller, *Supt*.....Richmond, Ind.
Geo. H. Prescott, *M. M*.....Logansport, Ind.
Chas. H. Starr, *M. C. B*.....Logansport, Ind.
Chi. Div.: C. C. F. Bent, *Supt*. Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4-9 g. 374 m. 83 lo. 2,808 cars.
Joseph Hill, *Gen. Supt*.....St. Louis, Mo.
C. R. Waddle, *Ex. Agt & Supt. M. P. &c.*; and
E. D. Carter, *M. C. B*.....Terre Haute, Ind.
Clinton Idler, *M. M*.....Indianapolis, Ind.
Chas. Butler, *M. M*.....Effingham, Ill.
A. W. Quakenbush, *M. M*.....Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4-9 g. 2,700 m. 1,271 loco. 51,894 cars.
Frank Thomson, *Gen Man*.....Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.....Philadelphia, Pa.
John Reilly, *Supt. Trans*.....Philadelphia, Pa.
T. N. Ely, *Supt. ao. Pa.*(4 Gen. Divs. Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4-9 g. 1,105 m. 627 lo. 35,583 cars.
Charles E. Pugh, *Gen Supt*.....Altoona, Pa.
Phila. Div.: S. M. Prevost, *Supt*. Philadelphia, Pa.
H. D. Garrett, *M. M*.....W. Philadelphia, Pa.
J. W. Van Leuven, *M. C. B*.....Phila. Pa.
Mid. Div.: H. H. Carter, *Supt*.....Harrisburg, Pa.
E. L. Caum, *M. M*.....Harrisburg, Pa.
Samuel Myers, *M. C. B*.....Harrisburg, Pa.
Alt'a Div.: Wm. J. Latta, *Supt*.....Altoona, Pa.
G. W. Strattan, *M. M*.....Altoona, Pa.
John Cranmer, *M. C. B*.....Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*.....Pittsburg, Pa.
D. O. Shaver, *M. M*.....Pittsburg, Pa.
J. G. Stewart, *M. C. B*.....Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt*. Blairsville, Pa.
C. B. Street, *M. M*.....Blairsville, Pa.
M. H. Fails, *M. C. B*.....Blairsville, Pa.
Fred. C. Hutchinson, *Supt*.....Altoona, Pa.
Tyrone Div.: S. S. Blair, *Supt*.....Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt*. Lewistown, Pa.
Bed. Div.: Robert Reber, *Supt*.....Bedford, Pa.
Monong. Div.: David M. Watt, *Supt*. Pittsburg, Pa.
Wm. Linlinger, *M. M*.....Pittsburg, Pa.
(2) United R. R. of N. J. Divs. 414 m. 276 lo. 9,698 c.
F. Wolcott Jackson, *Gen. Sit.* Jersey City, N. J.
N. Y. Div.: Jas. McCrea, *Supt* Jersey City, N. J.
H. S. Haines, *Asst. Sit. M. P.* Jersey City, N. J.
David H. Baker, *M. C. B*.....Jersey City, N. J.
L. A. Brosdeve, *M. M*.....Jersey City, N. J.
F. F. Bosdevex, *M. C. B*.....Jersey City, N. J.
Belv. Div.: J. A. Anderson, *Supt* Lambertville, N. J.
R. McDowell, *M. M*.....Lambertville, N. J.
Amboy Div.: J. S. Buckalew, *Supt*. Camden, N. J.
Thos. Hall, *M. M*.....So. Amboy, N. J.
P. S. Bogart, *M. C. B*.....So. Amboy, N. J.
(3) West Jersey R. R. 4-9 g. 163 m. 22 lo. 342 cars.
Thos. Crawford, *Supt*.....Camden, N. J.
W. McAllister, *M. M*.....Camden, N. J.
C. C. Williams, *M. C. B*.....Camden, N. J.
(4) Phila. Wilm. & Balt. R.R. 223 m. 78 lo. 2,331 c.
H. F. Kenney, *Gen. Supt*.....Philadelphia, Pa.
S. A. Hodgman, *M. M*.....Wilmington, Del.
Wm. Lindgren, *M. C. B*.....Wilmington, Del.
Cen. Div.: Jas. K. Lodge, *Supt*.. Philadelphia, Pa.
S. D. Danfield, *M. M. & C. B*.....Chester, Pa.
Del. Div.: N. Mills, *Supt*.....Philadelphia, Pa.
(5) Phila. & Erie R. R. Divs. 376 m. 117 lo. 3,483 c.
R. Neilson, *Gen. Supt*.....Williamsport, Pa.
R. H. Soule, *Supt. Mo. Po*.....Williamsport, Pa.
E'n. Div.: Thos. Gucker, *Supt*. Williamsport, Pa.
Sunb'y Rd.: A. B. Starr, *Supt*. Williamsport, Pa.
W. F. Beardsley, *M. M*.....Sunbury, Pa.
Mid. Div.: E. B. Westfall, *Supt*.....Renova, Pa.
W. L. Forster, *M. M*.....Renova, Pa.
West'n Div.: J. W. Reynolds, *Supt*.....Erie, Pa.
W. T. Smith, *M. M*.....Erie, Pa.
(6) Northern Central Ry. 4-9 g. 323 m. 152 lo. 6,163 c.
A. W. Sumner, *Pur. Agt*.....Baltimore, Md.
Susq., Shamokin, Elmira & Canadaigua Divs. :
Robert Neilson, *Gen. Supt*.. Williamsport, Pa.
R. H. Soule, *Supt. M. P*.....Williamsport, Pa.
Susq. Div.: Thomas Sucker, *Supt*. Williamsport, Pa.
G. W. Dannerst, *M. C. B*.. Williamsport, Pa.
Sham. Div.: *Supt*.....Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt*.. Elmira, N. Y.
Jas. Steele, *M. M*.....Elmira, N. Y.
J. C. Dyott, *M. C. B*.....Elmira, N. Y.
Baltimore Divs. of Northern Central; and
Baltimore & Potomac R. R. 128 m. 29 lo. 356 c.
G. G. Wilkins, *Supt*.....Baltimore, Md.
A. W. Sumner, *Pur. Agt*.....Baltimore, Md.
A. O. Dayton, *Supt. Mo. Po*.....Baltimore, Md.
J. M. Odell, *M. M*.....Baltimore, Md.
Penn. Coal Co.'s R. R. 4-3 g. 67 m. 23 eng. 2,871 c.
J. B. Smith, *Gen. Supt*.....Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*.....Ridgeway, Pa.
Pennsylvania & New York R. R. (*See Lehigh.*)
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 73 cars.
B. F. Simmons, *Tr. & Supt*.....Pensacola, Fla.
People's Ry. 4-8½ g. 6 m. 3 lo. 17 cars.
Chas. Baker, *Pres*.....Pottsville, Pa.
Peoria, Decatur & Evansville Ry.
4-8½ g. 215 m. 12 lo. 725 cars.
G. L. Bradford, *Gen. Man*.....Peoria, Ill
G. R. Cobleigh, *Supt. & Pur. Agt*...Peoria, Ill.
P. Reilly, *M*.....Mattoon, Ill.
T. S. Tufts, *M. C. B*.....Mattoon, Ill.
Peoria & Farmington R. R. 25 miles.
D. P. Phelps, *Gen. Man*.....Monmouth, Ill.
Peoria & Pekin Union Ry. 4-8½ g. 20 miles.
Thos. H. Burnett, *Gen. Supt*.....Peoria, Ill
R. F. Hurd, *M. M. & C. B*.....Peoria, Ill
Perkiomen R. R. 4-8½ gauge 68 miles.
Jno. B. Dick, *Supt*.....Norristown, Pa.
Petersburg R. R. 4-8½ g. 64 m. 10 lo. 89 cars.
R. M. Sully, *Gen. Supt*.....Petersburg, Va.
L. E. Clark, *Pur. Agt*.....Petersburg, Va.
R. B. Andrew, *M. M*.....Petersburg, Va.
J. W. Fleming, *M. C. B*.....Petersburg, Va.
Phila., Marlton & Medford R. R. (*Op. by Penn. & At.*)
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Phila. & Atlantic City Ry. 3-6 g. 55 m. 11 lo. 129 cars.
Ellis Clark, *Supt*.....Philadelphia, Pa.
J. W. Wright, *M. M*.....Camden, N. J.
E. Lippincott, *M. C. B*.....Camden, N. J.
Phila. & Reading. 4-8½ g. 809 m. 516 lo. 21,504 cars.
John B. Wootten, *Gen. Man*.Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*.....Philadelphia, Pa.
Geo. Eltz, *Supt. Trans*.....Reading, Pa.
L. B. Faxon, *Eng. of Mach*.....Reading, Pa.
John H. Rankin, *M. C. B*.....Reading, Pa.
No. Pa. & B. Brk. Div.: E. A. Sweigard, *Supt.*, and
Jackson Richards, *M. M*.....Phila., Pa.
Cat. & W. Br.: D. C. Reinhart, *S.* Williamsport, Pa.
W. H. Ellis, *M. M*.....Catawissa, Pa.
C. D. Ellis, *M. C. B*.....Catawissa, Pa.
Leb. & Tr. Br.: H. W. Tracy, *Supt*. Pine Grove, Pa.
Coal Br.: J. H. Olhausen, *Supt*. Mahony Plane, Pa.
R. & C. Br.: A. M. Wilson, *Supt.*, Columbia, Pa.
P. N. & N. Y. Rd.: W. M. Geary, *S.* Morrisdown, Pa.
S. & Le. Rd.: E. Dale, *Supt*.....Reading, Pa.
Pittsburg, Bradford & Buffalo Ry. 3 g. 31 m. 4 lo. 7c.
J. M. Dickey, *Gen. Man*.....Foxburg, Pa.
J. M. Mandeville, *Supt*.....Foxburg, Pa.
Pittsburg, Cincinnati & St. Louis Ry. (*See Penna. Co.*)
Pittsburg, Ft. Wayne & Chicago Ry. (*See Penna. Co.*)
Pittsburg Southern Ry. 3 g. 38 m. 4 lo. 64 cars
Jos. Ramsey, *Jr. Supt. & P. A*.....Pittsburg, Pa.
W. S. Marshall, *M. M*.....Pittsburg, Pa.
E. B. Gosline, *M. C. B*.....Pittsburg, Pa.
Pitts. & Castle Shannon R. R. 3-4 g. 9 m. 5 lo. 388 c.
James M. Bailey, *Gen. Supt*.....Pittsburg, Pa.
A. C. Hays, *Supt*.....Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4-8½ g. 70 m. 24 lo. 1,402 c.
W. C. Bailey, *Gen. Man*.....Pittsburg, Pa.
R. W. Jones, *Mast. Trans*.....Pittsburg, Pa.
S. W. Haines, *M. M*.....Pittsburg, Pa.
Pittsburg & Western R. R. 3 g. 47 m. 2 lo. 76 cars.
J. J. Saint, *Gen. Man*.....Allegheny, Pa.
W. J. Bonner, *Supt*.....Allegheny, Pa.
W. J. Hofecker, *M. M*.....Zelienople, Pa.
Port Huron & No.-Western Ry. 3 g. 105 m. 4 lo. 46 c.
H. McMoran, *G. Man. & P. A*.Port Huron, Mich.
J. R. Wadsworth, *Supt*.....Port Huron, Mich.
Chas. Deifenbaur, *M. M*.....Port Huron, Mich.
Benj. Hillier, *M. C. B*.....Port Huron, Mich.
Port Jervis & Monticello R. R. 6 g. 34 m. 2 lo. 13 c.
M. V. H

Rome, Watertown & Ogdensburg R. R.
4-8½ g. 400 m. 51 lo. 1,248 cars.
E. A. Van Horne, *Gen. Supt.*.....Oswego, N. Y.
Geo. W. R. Cushing, *Pur. Agt.*, New York, N. Y.
Geo. H. Haselton, *M. M. & C. B.*, Oswego, N. Y.
Rumford Falls & Buckfield R.R. 4-8½ g. 29 m. 21 lo. 42 c.
O. Hayford, *Supt.*.....Canton, Me.

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Sabine & East Texas Ry. 4-8½ g. 25 miles.
R. H. Cousins, *Supt.*.....Beaumont, Tex.
Sacramento & Placerville R. R. 4-8½ g. 40 m. 3 lo. 6 c.
J. B. Wright, *Gen. Supt.*.....Sacramento, Cal.
Saginaw Bay & Northw'n R. R. 4-8½ g. 20 miles.
E. W. Gerrish, *Supt.*.....Pinconning, Mich.
Saginaw Valley & St. Louis R. R. 4-8½g. 35 m. 41. 64 c
N. W. Merrill, *Supt.*.....Saginaw, Mich.
Salem & Eastern R. R. 4-8½ g. 0 miles.
R. T. Parker, *Supt.*.....Salem, Mo.
Salisbury R. R. 4-8½ g. 9 m. 1 lo. 2 cars.
R. J. Bateer, *Supt.*.....Meyerslale, Pa.
Sandy River R. R. 2 g. 18 m. 2 lo. 10 cars.
Joel Wilbur, *Supt.*.....Phillips, Me.
San Francisco & No. Pac. 4-8½ g. 92 m. 7 lo. 171 c.
Arthur Hughes, *Gen. Man.*..San Francisco, Cal.
H. C. Whiting, *Supt.*.....Petaluma, Cal.
P. E. Dougherty, *Pur. Agt.*San Francisco, Cal.
Ed. Reynolds, *M. M.*.....Donahue, Cal.
John Martin, *M. C. B.*.....Donahue, Cal.
San Luis Obispo & Santa Maria Val. R. R. 3 g. 11 m.
Dr. John O. Farrell, *Man.*...San Francisco, Cal.
C. A. Haskin, *Supt.*.....San Luis Obispo, Cal.
Santa Cruz R. R. 3 g. 21 m. ..Santa Cruz, Cal.
Savannah, Florida & W'n Ry. 5 g. 422 m. 26 lo. 396 c.
H. S. Haines, *Gen. Man.*.....Savannah, Ga.
E. G. Fleming, *Supt.*.....Savannah, Ga.
W. B. McKee, *Pur. Agt.*.....Savannah, Ga.
James D. Hollister, *M. of Mach.*,Savannah, Ga.
P. N. Raynal, *For. Car Dept.*..Savannah, Ga.
Sav., Griffin & No. Ala. R. R. Op. by Central (6-a.).
Schuylkill & Lehigh R. R. 4-8½ g. 43 miles.
Elbridge Dale, *Supt.*.....Reading, Pa.
Scoharie Valley R. R. (*See Middletown & sch.*)
C. G. Browning, *M. M. & P. A.*...Portsmouth, O.
Scioto Valley R. R. 4-8½ g. 131 m. 13 lo. 291 cars.
Joseph Robinson, *Supt.*.....Columbus, O.
C. G. Browning, *M. M.*.....Portsmouth, O.
Seaboard & Roanoke R. R. (*See Rail, & Asg. A. L.*)
Selma & Greensboro R. R. 5 g. 45 m. 2 lo. 30 cars.
A. M. Fowlkes, *Supt.*.....Selma, Ala.
J. M. Levis, *M. M.*.....Marion, Ga.
Shenandoah Valley R. R. 4-8½ g. 143 m. 15 lo. 314 c.
J. H. Sands, *Supt.*.....Hagerstown, Md.
Shenango & Allegheny R.R. 4-9½ g. 47 m. 6 lo. 156 c.
J. T. Blair, *G. Supt. & Pur. Agt.*Greenville, Pa.
Edw. Richardson, *M. M. & C. B.*Greenville, Pa.
Shepaug R. R. 4-8½ g. 38 m. 3 lo. 37 cars.
Edwin McNeill, *Supt.*.....Litchfield, Ct.
C. M. Allen, *M. M.*.....Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 25 cars.
C. L. Harris, *Supt.*.....Ripley, Miss.
Silver Lake Ry. 0 g. 0 m. 2 lo. 3 cars.
E. G. Matthews, *Supt.*.....Perry, N. Y.
Sioux City & Pacific R. R. 4-8½ g. 427 m. 15 lo. 2146.
P. E. Hall, *Gen. Man.*.....Cedar Rapids, Ia.
J. S. Wattles, *Supt.*.....Missouri Valley, Ia.
C. F. McCoy, *Asst. Supt.*.....Blair, Neb.
C. H. Foster, *M. M. & C. B.*Missouri Valley, Ia.
Skaneateles R. R. 4-8½ g. 5 m. 2 lo. 4 cars.
J. McNamara, *Supt.*.....Skaneateles, N. Y.
Somerset R. R. 4-8½ g. 25 m. 2 lo. 11 cars.
W. M. Ayer, *Act. Supt.*.....W. Waterville, Me.
South Carolina R. R. 5 g. 243 m. 42 lo. 685 cars.
John B. Peck, *Gen. Man. & Supt.*.Chas'ton, S. C.
S. B. Pickens, *Pur. Agt.*.....Charleston, S. C.
R. J. Cochrane, *Mast. of Mach.*Charleston, S. C.
Geo. H. Gramling, *M. C. B.*....Charleston, S. C.
South-Eastern Ry. 4-8½ g. 161 m. 14 lo. 446 cars.
Bradley Barlow, *Gen. Man.*....St. Albans, Vt.
H. A. Alden, *Supt.*.....Richford, Vt.
A. G. Eastman, *M. M.*.....Richford, Vt.
South Florida R. R. 3 g. 22 m.
R. B. Swoope, *Supt.*.....Sanford, Fla.
South Mountain R. R. 4-8½ g. 18 m.
W. H. Woodward, *Supt.*Pine G've & Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 10 lo. 260 coast R.
A. H. Fracker, *Gen. Supt.*..San Francisco, Cal.
E. L. Reese, *M. M. & C. B.*.....Newark, Cal.
South-Western R. R. (Ga.) (*See Central R. R. (Ga.)*
South-Western Ry. (Ky.) 4-8½ g. 4 m. 1 lo. 38 cars.
M. Tabler, *Supt.*.....Harrodsburg, Ky.
Southern Central R. R. 4-8½ g. 114 m. 10 lo. 947 c.
James G. Knapp, *Supt.*.....Auburn, N. Y.
Chas. G. Brown, *M. M.*.....Auburn, N. Y.
H. Mooney, *M. C. B.*.....Auburn, N. Y.
Southern Maryland R. R. 4-9 g. 47 m.
Shields Burr, *Supt.*.....Brandywine, Md.
Southern Pacific R. R. 4-8½ g. 161 m. 29 lo. 758 c.
Northern Div. (*For other Divs. see Cen. Pac.*)
A. C. Bassett, *Supt.*.....San Francisco, Cal.
J. R. Watson, *Pur. Agt.*.....San Francisco, Cal.
J. T. Wilson, *M. M.*.....San Francisco, Cal.
F. N. Bellisle, *M. C. B.*.....San Francisco, Cal.
Springfield, Effingham & So.-Eastern and
Bloomfield Rys. 3 g. 80 m.
E. Pratt Buell, *Gen. Man.*.....Robinson, Ill.
Spring Hill & Parrsboro Ry. 4-8½ g. 32 m. 1 lo. 64 c.
J. Skillan, *Supt.*.....Parrsboro, N. S.
Springville & Sardinia Ry. 3 g. 12 m. 2 lo. 9 c.
B. Chafee, *Pres.*.....Springville, N. Y.
St. Clairsville Ry. 3 ft. gauge 7 miles 2 cars.
J. H. Patterson, *Pres.*.....St. Clairville, O.
St. Croix & Penobscot R. R. 4-8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, *Supt.*.....Calais, Me.
G. H. Corsen, *M. M.*.....Milltown, Me.
H. C. Tincker, *M. C. B.*.....Milltown, Me.
St. Joe & Desloge Ry. 3 ft. gauge 5 miles.
J. Naramore, *Supt.*.....Bonne Terre, Mo.
St. John & Maine Ry. 4-8½ g. 92 m. 6 lo. 110 cars.
H. D. McLeod, *Supt.*.....
St. John's Ry. 4-8½ g. 12 m. 2 lo. 24 cars.
R. McLaughlin, *Pr. & Supt.*.Jacksonville, Fla.
Jas. M. Owens, *M. of Mach.*.Jacksonville, Fla.
St. Johns & Lake Eustis Ry. 3 g. 26 m.
T. S. Davies, *Supt.*.....Volusia, Fla.
St. Johnsb'y & Lake Champ. 4-8½ g. 120 m. 7 lo. 97 c.
A. B. Jewett, *Supt.*.....St. Johnsbury, Vt.
Geo. E. Howe, *M. M.*.....St. Johnsbury, Vt.
St. Joseph & Des Moines R. R. (*See K. C., St. J. & C. B.*)
St. Lawrence & Ottawa Ry. 4-8½ g. 50 m. 10 l. 146 c.
Walter Shanley, *Gen. Man.*.....Ottawa, Ont.
Calvin Dame, *M. M. & C. B.*.....Prescott, Can.
St. Louis, Alton & Terre Haute R. R.
Main Line. (*See Ind. & St. L. Div. : Ohio Ry.*)
St. Louis & Cairo Div. : 4-8½ g 123 m. 16 lo. 778 c.
G. W. Parker, *Gen. Man.*.....St. Louis, Mo.
A. M. De Clerq, *M. M.*.....St. Louis, Mo.

St. Louis Bridge Co. and Tunnel R. R.
4-8½ g. 17 m. 15 lo. 11 cars.
Wm. Tansey, *Gen. Man.*.....St. Louis, Mo.
G. O. Clinton, *Supt.*.....St. Louis, Mo.
E. T. Brandley, *Pur. Agt.*.....St. Louis, Mo.
H. M. Smith, *M. M.*.....St. Louis, Mo.
St. Louis Coal R. R. 4-8½ g. 28 m. 1 lo. 78 cars.
R. J. Cavett, *Supt.*.....Carbondale, Ill.
St. Louis, Ft. Scott & Wichita R. R. 200 miles.
F. Tiernan, *V. P. & Gen. Man.*.Fort Scott, Kan.
L. D. Latham, *Supt.*.....Fort Scott, Kan.
St. L., Hannibal & Keokuk. 4-8½ g. 50 m. 1 lo. 23 c.
W. W. Walker, *Supt.*.....Hannibal, Mo.
Geo. Douglass, *Pur. Agt.*.....Hannibal, Mo.
St. Louis, Iron Mountain & Southern Ry. (1).
International & Great Northern R. R. (2); and
Texas & Pacific Ry. (3).
4-8½ g. 3,078 m. 240 lo. 6,119 cars.
H. M. Hoxie, *Gen. Man.*.....St. Louis, Mo.
R. B. Lyle, *Pur. Agt.*.....St. Louis, Mo.
(1) St. L., I. M. & So. 4-8½ g. 710 m. 37 lo. 1,081 c.
E. L. Dudley, *Supt.*.....St. Louis, Mo.
O. A. Haynes, *Supt. Mach.*.....St. Louis, Mo.
Oscar Goodlife, *M. C. B.*.....St. Louis, Mo.
St. Louis Div. : J. J. Frey, *Supt.*.....St. Louis, Mo.
W. H. Harris, *M. M.*.....De Soto, Mo.
H. M. Aldrich, *M. C. B.*.....De Soto, Mo.
Ark. Div. : Wm. Kerrigan, *Supt.* Little Rock, Ark.
L. Finlay, *M. M. & C. B.*.....Little Rock, Ark.
(2) Inter. & Gr't N. R. R. 4-8½ g. 776 m. 45 lo. 932 c.
R. H. Johnson, *M. M.*.....Palestine, Tex.
H. H. Sessions, *M. C. B.*.....Palestine, Tex.
Gulf Div. : J. W. Goodwin, *Supt.*.....Houston, Tex.
San Ant. Div. : Jos. Hurion, *Supt.*San Antonio, Tex.
(3) Texas & Pac. Ry. 4-8½ g. 1,030 m. 58 lo. 1,106 c.
Geo. S. Sand, *Asst. Gen. Supt.*..Marshall, Tex.
J. F. Sechler, *Gen. M. M.*.....Marshall, Tex.
H. H. Sessions, *M. C. B.*.....Marshall, Tex.
So'n Div. : Hugh Irvine, *Supt.*....Longview, Tex.
H. I. Bearup, *M. M.*.....Marshall, Tex.
Tr. Con. Div. : J. S. Noble, *Supt.*Texarkana, Ark.
Thos. Ormerod, *M. M.*.....Texarkana, Ark.
W'n Div. : Wm. Davis, *Supt.*.....Ft. Worth, Tex.
W. H. Reilly, *Asst. G. M. M.* Fort Worth, Tex.
St. L. Keokuk & No.-W'n. 4-8½ g. 187 m. 14 lo. 312 c.
A. L. Griffin, *V. Pr. & Gen. Supt.*..Keokuk, Ia.
H. B. Blood, *Supt.*.....Keokuk, Ia.
John A. Blood, *Pur. Agt.*.....Keokuk, Ia.
Wm. Foley, *M. M.*.....Keokuk, Ia.
St. L., Salem & Little Rock. 4-9 g. 69 m. 5 lo. 103 c.
Geo. S. Sand, *Asst. Gen. Supt.*..Marshall, Tex.
H. A. Crawford, *V. Pr. & P. A.*..St. Louis, Mo.
E. B. Sankey, *Supt.*.....Salem, Mo.
Thomas Everson, *M. M.*.....Steelville, Mo.
I. W. Houston, *M. C. B.*.....Steelville, Mo.
St. L., Van. & T. H. (*See T. H. & I. Div. of Penna. Co.*)
St. L. & San Fran. Ry. 4-8½ g. 758 m. 71 lo. 2,490 c.
C. W. Rogers, *Sd V. Pr & G. Man.*St. Louis, Mo.
D. H. Nichols, *Mast. Trans.*.No. Springfield, Mo.
A. G. Thompson, *Pur. Agt.*.....St. Louis, Mo.
M. Kearney, *M. M. & C. B.*..No. Springfield, Mo.
Mo. & Ark. Div. : W. A. Thoms, *Supt.* do.
Kan. Div. : J. R. Wentworth, *Supt.*Neod sha.Kan.
St. Martin's & Upham Ry. 4-8½ g. 30 m. 1 lo.
E. E. Sallam, *Manager*.....St. Martin's, N. B.
St. Paul & Duluth R. R. 4-8½ g. 195 m. 24 lo. 580 c.
Gen. Supt.....St. Paul, Minn.
J. G. Callahan, *Pur. Agt.*.....St. Paul, Minn.
W. McFarland, *M. M.*.....St. Paul, Minn.
John Hill, *M. C. B.*.....St. Paul, Minn.
St. Paul, Minneapolis & Manitoba Ry. do.
4-8½ g. 1,050 m. 116 lo. 3,116 cars.
A. Manvel, *Gen. Man.*.....St. Paul, Minn.
E. B. Wakeman, *Supt. Trans.*..St. Paul, Minn.
J. C. Morrison, *Pur. Agt.*.....St. Paul, Minn.
A. A. Ackerly, *M. M.*.....St. Paul, Minn.
Brock. Div. : A. Guthrie, *Supt.*.....St. Paul, Minn.
F. F. Div. : J. B. Rice, *Supt.*.....St. Paul, Minn.
No'n Div. : C. O. Wheeler, *Supt.*Fergus Falls, Minn.
State Line & Susquehanna R. R. 4-8½ g. 29 m. 2 lo. 3 c.
J. O. Blight, *Supt.*.....Towanda, Pa.
Staten Island R. R. 4-8½ g. 13 m. 4 lo. 17 c.
John W. Culbert, *Supt.*.....Tottenville, N. Y.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, *Supt.*.....Sloatsburg, N. Y.
Stony Creek R. R. 4-8½ g. 10 miles.
Geo. B. Boggs, *Supt.*.....Norristown, Pa.
Strasburg R. R. 4-8½ g. 5 miles.
Isaac Thenegar, *Lessee*.....Leman Place, Pa.
Sussex R. R. (*See Del. & H. Co.*)
Syracuse, Binghamton & N. Y. R. R. (*See D. L. & W.*)
Syracuse, Chenango & N. Y. 4-8½ g. 44 m. 4 lo. 60 c.
Albert Ashley, *Supt.*.....Syracuse, N. Y.
George W. West, *M. M.*.....Syracuse, N. Y.
Wm. J. McMichael, *M. C. B.*...Syracuse, N. Y.
Syracuse, Geneva & Corning. Corning, Chemung & Antrim R. Rs. 4-8½ g. 121 m. 23 lo. 1,044 c.
A. H. Gorton, *Supt.*.....Corning, N. Y.
Andrew Beers, *Pur. Agt.*.....Corning, N. Y.
O. C. Patchell, *M. M. & C. B.*....Corning, N. Y.

T

Talbotton R. R. 7 miles.
W. H. Martin, *Supt.*.....Talbotton, Ga.
Terre Haute & Indianapolis R. R. (*See Penna. Co.*)
Terre Haute & Logansport R. R. (*Op. by T. H. & Ind.*
Terre Haute & So.-Eastern Ry. 4-9 g. 40 miles.
Geo. Atherton, *Supt.*.....Terre Haute, Ind.
Texas-Mexican; and Mexican National Rys.
3 g. 217 m. 4 lo. 54 cars.
G. C. Gardner, *Gen. Man.*.....New York, N. Y.
A. R. Roberts, *Pur. Agt.*.....New York, N. Y.
W. W. Hungerford, *G. Sup.* Corpus Christi, Tex.
J. C. Monroe, *M. M.*.....Mexico, Mex.
Maj. W. J. Brokaw, *M. M.*.....Manzanillo, Mex.
Texas Western Ry. 3 g. 42 m. 2 lo. 34 cars.
J. W. Goodwin, *Supt.*.....Houston, Tex.
Texas & New Orleans; Louisiana W'n; and Morgan's Louisiana & Tex. Rs. 4-8½ g. 302 m. 4 lo. 276 c.
J. F. Crosby, *Gen. Man.*.....Houston, Tex.
P. B. Watson, *Pur. Agt.*.....Houston, Tex.
T. & N. O. Div. : C. A. Burton, *Supt.*Houston, Tex.
D. C. Smith, *M. M.*.....Houston, Tex.
J. M. Mather, *M. C. B.*.....Houston, Tex.
La. W'n Div. : C. A. Burton, *Supt.*..Houston, Tex.
B. B. Harrop, *M. M.*.....Vermillionville, La.
M. La. & Tex. Div. : G. Pandeley, *S. N.*Algiers, La.
N. Tilton, *M. M.*.....Algiers, La.
William O'Brien, *M. C. B.*.....Algiers, La.
Texas & Pacific Ry. (*See St. L., Iron M. & S. Ry.*)
Texas & St. Louis Ry. 3 g. 258 m. 10 lo. 241 cars.
J. W. Brown, *Gen. Supt.*.....Tyler, Tex.
F. W. Paramore, *Pur. Agt.*.....St. Louis, Mo.
W. J. Lewis, *M. M.*.....Tyler, Tex.
Tioga and Elmira State Line R. Rs.
4-8½ and 6 g. 54 m. 17 lo. 953 cars.
L. H. Shattuck, *Supt.*.....Blossburg, Pa.
James A. Drake, *Pur. Agt.*.....Elmira, N. Y.
Pere Bonny, *M. M.*.....Blossburg, Pa.
D. H. Stratton, *M. C. B.*.....Blossburg, Pa.

Toledo, Ann Ar. & Gr. Tr. Ry. 4-8½ g. 84 m. 7 lo. 107 c
M. D. Woodford, *Gen. Man.*..Ann Arbor, Mich.
H. W. Ashley, *Supt.*.....Ann Arbor, Mich.
B. F. Jervis, *Pur. Agt.*.....Ann Arbor, Mich.
Charles Humphrey, *M. M.*....Ann Arbor, Mich.
Toledo, Delphos & Burl. R. R. 3 g. 422 m. 21 lo. 694 c.
T. A. Phillips, *Gen. Man.*.....Toledo, O.
J. H. F. Wiers, *Supt. Mach. & P. Agt* Toledo, O.
Toledo; and Tol., Cin. & St. Louis Divs.
A. J. Mathenay, *Supt.*.....Delphos, O
E. Clemons, *M. M.*.....Delphos, O
Day & S.-E'n Div : J. H. Weller, *Supt.*Dayton, O.
F. McCreary, *M. M.*.....Dayton, O.
Toledo & South Haven R. R. (*See Pur Pine.*)
Tonawanda Valley R. R. 3 g. 19 m. 1 lo. 13 cars.
J. V. D. Loomis, *Supt.*.....Attica, N. Y.
Toronto, Grey & Bruce Ry. 4-8½ g. 191 m 20 lo 446 c.
Edmund Wragge, *Gen. Man.*..Toronto, Can.
W. Watson, *Pur. Agt*.....Toronto, Can.
David Preston, *M. M.*.....Toronto, Can.
Toronto & Nipissing Ry. 3-6 g. 105 m. 12 lo. 211 c.
John Duncan, *Supt.*.....Toronto, Can.
John Symons, *Pur. Agt.*.....Toronto, Can.
J. Haggas, *M. M.*.....Toronto, Can.
Troy & Boston R. R. 4-8½ g. 48 m. 20 lo. 484 cars.
D. Hoffman, *Pres. & Pur. Agt.*.....Troy, N. Y.
Joseph Conant, *Supt.*.....Troy, N. Y.
Z. B. Davis, *M. M.*.....Troy, N. Y.
R. V. Coon, *M. C. B.*.....Troy, N. Y.
Tuckerton R. R. 4-8½ g. 31 m. 2 lo. 28 cars.
J. J. Pharo, *Supt.*.....Tuckerton, N. J.
Tuskegee R. R. 3 g. 5 m. 1 lo. 6 cars.

U

Ulster & Delaware R. R. 4-8½ g. 74 m. 7 lo. 142 cars.
Jas. H. Jones, *Supt.*.....Rondout, N. Y.
Geo. W. Wright, *M. M.*.....Rondout, N. Y.
John H. Decker, *M. C. B.*.....Rondout, N. Y.
Union Pacific Ry. (4 Gen. Divs.)
3 & 4-8½ g. 3,650 m 318 lo. 6,157 cars.
S. H. H. Clark, *Gen. Man.*.....Omaha, Neb.
Thos. L. Kimball, *Asst. Gen Man.*Omaha, Neb.
A. D. Clarke, *Pur. Agt.*.....Omaha, Neb.
(1) Union Div. : J. T. Clark, *Gen Supt.*.....Omaha, Neb.
I. H. Congdon, *Gen. M. M.*.....Omaha, Neb.
Geo. E. Stevens, *Supt. Car Dept.* Omaha, Neb.
East. Divs. : P. J. Nichols, *Supt.*.....Omaha, Neb.
Robt. McConnell, *M. M.*.....Omaha, Neb.
A. M. Collett, *M. C. B.*.....Omaha, eb.
Jas. H. McConnell, *M. M.*.....No. Platte, Neb.
A. Reis, *For. Car. Sh.*.....No. Platte, Neb.
Mtn. Div. : Robt. Law, *Supt.*....Cheyenne, Wy. T.
T. A. Davies, *M. M.*.....Cheyenne, Wy. T.
J. E. Davies, *For. Car. Sh.*..Cheyenne, Wy. T.
Lar. Div. : E. Dickinson, *Supt.*..Laramie, Wy. T.
R. Galbraith, *M. M.*.....Laramie, Wy. T.
R. M. Galbraith, *M. M.*.....Rawlins, Wy. T.
Frank Blake, *For. Car. Sh.*..Rawlins, Wy. T.
West. Div. : W. B. Doddridge, *Supt.*Evanston, Wy. T.
C. C. Quinn, *M. M.*.....Evanston, Wy. T.
R. V. Brinkley, *For. Car. Sh.*Evanston, Wy. T.
Utah Nor. Div. : G. W. Thatcher, *Supt.*, Logan, U.
R. Craft, *M. M.*.....Logan, U.
F. Reardon, *M. M.*.....Eagle Rock, Idaho
F. M. Shoemaker, *For. Car. Sh.*Eagle R'k, Ida.
Col. Div. : A. E. Egbert, *Supt.*.....Denver, Col.
Fred. Metzheimer, *M. M.*.....Golden Col
E. G. Thomas, *For. Car. Sh.*.....Golden, Col.
St. J. & W'n. Rail. : D. Tuthill, *Supt.*St. Joseph, Mo.
E. Sleppy, *M. M.*.....Grand Island, Neb.
E. Hansen, *For. Car. Sh.*.....Elwood, Kan.
(2) Kansas Div. : S. T. Smith, *G. Supt.*Kansas Cy, Mo.
Jno. Mackenzie, *Supt. Mach.*..Armstrong, Kan.
K. Val. Div. : Jas. Mackenzie, *M. M.*Armst'g, Kan.
T. B. Roberts, *For. Car. Sh.*Armstrong, Kan.
Smoke Hill Div. : J. B. Dalley, *M. M.*.....Ellis, Kan.
Denver Div. : O. H. Dorrance, *Supt.*..Denver, Col.
Chey. Div. : A. A. Egbert, *Supt.*.....Denver, Col.
R. McDougall, *M. M.*.....Denver, Col.
W. Ogle, *For. Car. Sh.*(D. & C. Divs.)Den., Col.
(3) Denver & South Park Div. 3 ft. gauge 227 miles.
C. W. Fisher, *Gen. Supt.*.....Denver, Col.
J. H. Kirk, *M. M.*.....Denver, Col.
(4) Nevada Central Ry. 3 g. 93 m. 5 lo. 82 cars.
E. W. Dunn, *Supt.*.....Battle Mountain, Nev.
Z. T. Spriggs, *M. M.*.....Battle Mountain, Nev.
United States Rolling Stock Co. 23 lo. 4,834 cars.
A. Hegewisch, *Pres.*.....New York, N. Y.
C. F. Jauriet, *Gen. M. M.*.....Toledo, O.
Utah Central Ry. 4-8½ g. 280 m.
John Sharp, *Gen. Supt.*.Salt Lake City, Utah.
S. H. Hill, *Pur. Agt.*.....Salt Lake City, Utah.
W. B. Armstrong, *M. M.*.Salt Lake City, Utah.
Sam. S. Tucker, *M. C. B.*.Salt Lake City, Utah.
Utah Western Ry. 3 g. 37 m.
W. W. Ritter, *Gen. Man.*...Salt Lake City, Utah.
Robert Anderson, *M. M.*..Salt Lake City, Utah.
Utah & Pleasant Valley Ry. 60 m.
G. M. Young, *Gen. Man.*.....Salt Lake City, Utah.
Utica, Ithaca & Elmira Ry. 4-8½ g. 127 m. 11 lo. 152 c.
G. Jas. Rice, *Pres & Supt.*.Horse Heads, N. Y.
J. Lo. Greatsinger, *Pur. Agt.*..Bresport, N. Y.
Geo. W. Cleveland, *M. M.*.....Bresport, N. Y.
Wm. Ells, *M. C. B.*.....Bresport, N. Y.
Utica, & Black Riv. R. R. 4-8½ g. 180 m. 22 lo. 329 c.
J. F. Maynard, *Gen. Supt. & P. A.*..Utica, N. Y.
John Bailey, *M. M.*.....Utica, N. Y.
David James, *M. C. B.*.....Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4-8½ g. 30 m. 2 lo. 19 c.
G. B. Stevenson, *Gen. Supt.*.....Vacaville, Cal.
Valley Ry. 4-8½ g. 50 m. 10 lo. 312 cars.
Samuel Briggs, *Supt.*.....Cleveland, O.
R. G. Bosworth, *M. M.*.....Cleveland, O.
Chas. Blanchard, *M. C. B.*.....Cleveland, O.
Vermont Valley & Sullivan R. Rs. (*See Conn. Riv.*)
Vernon, Greensburg & Rushville R. R. 25 m.
Horace Scott, *Pres.*.....Greensburg, Ind.
Vicksburg, Shreveport & Pacific, and
Vicksburg & Meridian R. Rs. (*See Cin., No. & So. P.*)
Victoria Pr. Wks. & Ry. (*See Midland Ry of Can.*)
Virginia Midland Ry. 4-8½ g. 405 m. 38 lo. 631 cars.
T. M. R. Talcott, *Gen. Man.*.....Richmond, Va.
W. M. S. Dunn, *Gen. Supt.*.....Alexandria, Va.
J. E. Waddey, *M. M.*.....Alexandria, Va.
J. T. Nalls, *M. C. B.*.....Alexandria, Va.
Virginia & Truckee R. R. 4-8½ g. 52 m. 24 lo. 354 c.
H. M. Yerington, *Gen. Supt.*.....Carson, Nev.
C. P. Mason, *Pur. Agt.*.....Carson, Nev.
I. N. Fording, *M. M.*.....Carson, Nev.
B. Lyons, *M. C. B.*.....Carson, Nev.

W

Wabash, Chester & W'n R. R. 4-8½ g. 42 m. 2 lo. 32 c.
J. L. Hinckley, *Gen. Supt.*.....Chester, Ill.
Wabash, St. Louis & Pacific Ry. (3 Gen. Divs.)
4-8½ g. 3,341 m. 359 lo. 17,230 cars.
John C. Gault, *Gen. Man.*.....St. Louis, Mo.
R. W. Green, *Pur. Agt.*.....St. Louis, Mo.
(1) Eas'n Div. : Robert Andrews, *G. Supt.*Toledo, O.
U. H. Kohler, *M. C. B.*.....Toledo, O.
Ohio & Ind. Div. : G. W. Stevens, *Supt.*; and
C. R. Morris, *M. M.*.....Fort Wayne, Ind.
Ill. Div. : H. F. Clark, *Supt.*.....Springfield, Ill.
Jacob Johann, *M. M.*.....Springfield, Ill.
B. B. Boss, *M. C. B.*.....Decatur, Ill.
Rant'l Div. : B. F. Mathias, *Supt.*....Rantoul, Ill.
J. McCarthy, *M. M.*.....Rantoul, Ill.
Cairo Div. : Geo. Skinner, *Supt.*.....Danville, Ill.
A. Van Tuyl, *M. M.*.....Carmi, Ill.
(2) West. Div. : T. McKissock, *Gen. Supt.*St. Louis, Mo.
W. H. Selby, *M. M.*.....Moberly, Mo.
C. S. Buck, *M. C. B.*.....Moberly, Mo.
St. L., K. C. & N. Div. : G. W. Parsell, *Supt.* do.
Kan. Cy. Div. : M. G. Cary, *Supt.* Kansas City, Mo.
C. B. & O. Div. : J. W. Blanchard, *Supt.*; and
J. S. Hazen, *M. C. B.*.....Stanberry, Mo.
Quincy Div. : F. D. Schermerhorn, *S.*, Quincy, Ill.
(3) Chi. & Ia. Div. : W. F. Merrill, *G. Supt.*..Chicago, Ill.
Wm. O. Hewitt, *M. M.*.....Peoria, Ill.
R. M. Hemphill, *M. C. B.*.....Peoria, Ill.
Chicago Div. : A. A. Hobart, *Supt.*....Chicago, Ill.
Peoria Div. : F. L. Tomkins, *Supt.*.....Peoria, Ill.
Iowa Div. : E. N. Armstrong, *Supt.*...Keokuk, Ia.
D. Moin. Div. : H. B. Skeeles, *Supt.* D. Moines, Ia.
Walla Walla & Columbia Riv. R. R. (*See Ore. Ry.*)
Walkill Ry. 4-8½ g. 117 m. 9 lo. 169 cars.
G. H. Graves, *Supt.*.....Rondout, N. Y.
J. B. Dykeman, *M. M.*.....Rondout, N. Y.
John H. Decker, *M. C. B.*.....Rondout, N. Y.
Wasatch & Jordan Val. R. R. 3 g. 44 m. 7 lo. 300 c.
Geo. M. Young, *Supt.*.....Salt Lake City, Utah.
Warwick Valley R. R. 4-8½ g. 28 m. 2 lo. 18 cars.
Grinnell Burt, *Pres. & Pur. Agt.* Warwick, N. Y.
Chas. Caldwell, *Supt.*.....Warwick, N. Y.
Washington & Ohio R. R. 4-8½ g. 52 m. 5 lo. 79 c.
R. H. Havener, *Gen. Supt.*.....Alexandria, Va.
Edward Swart, *M. M.*.....Alexandria, Va.
John Harrison, *M. C. B.*.....Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 28 m. 3 lo. 15 c.
Jacob Swart, *Gen. Man.*.....Waynesburg, Pa.
J. G. Ritchie, *Supt.*.....Waynesburg, Pa.
Welland Ry. 4-8½ g. 25 m. 3 lo. 147 cars.
William Pay, *Supt.*.....St. Catharines, Ont.
Jas. Taylor, *M. M.*.....St. Catharines, Ont.
Wm. H. Pay, *M. C. B.*.....St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m.
Rolla Wells, *Supt.*.....St. Louis, Mo.
West Feliciana R. R. 4-8½ g. 27 m. 2 lo. 19 cars.
J. Burruss McGehee, *Pr. & G. S.*Bayou Sara, La.
J. A. Tilton, *M. M. & C. B.*.....Bayou Sara, La.
West Jersey R. R. (*See Penn. R. R.*)
West Virginia, Central & Pittsburgh Ry. 13 miles.
W. E. Porter, *Gen. Supt.*.....Piedmont, W. Va.
Western R. R. (of Ala.) 5 g. 88 m. 13 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 206 c.
Cecil Gabbett, *Gen. Man. & Supt.*...Mont., Ala.
Robert King, *M. M.*.....Montgomery, Ala.
F. M. Wade, *M. C. B.*.....Montgomery, Ala.
Western Counties' Ry. 4-8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, *Supt.*.....Yarmouth, N. Y.
Western Maryland R. R. 4-8½ g. 107 m. 12 lo. 289 c.
J. M. Hood, *Pr. & Gen. Man.*...Baltimore, Md.
David Hollis, *Mast. of Mach.*.Union Bridge, Md.
J. H. Nussear, *M. C. B.*.....Union Bridge, Md.
Western No. Carolina R. R. 4-8½ g. 155 m. 6 lo. 36 c.
V. E. McBee, *Supt.*.....Salisbury, N. C.
Geo. P. Erwin, *Pur. Agt.*.....Salisbury, N. C.
G. W. Gates, *M. M.*.....Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 8 lo. 952 c.
Wm. McRae, *Gen. Man.*.....Atlanta, Ga.
W. R. Webster, *Pur. Agt.*.....Atlanta, Ga.
John H. Flynn, *M. M.*.....Atlanta, Ga.
W. G. Grambling, *M. C. B.*.....Atlanta, Ga.
Whitby Pt., Perry & Lindsay Ry. (*See Midland, Can.*)
White Water R. R. 4-8½ g. 62 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt.* Ft. Wayne, Ind.
L. W. Wingert, *Mast. of Mach.*...Harrison, O.
Whitefield & Jefferson R. R. 4-8½ g. 10 m.
A. L. Brown, *Supt.*.....Whitefield, N. H.
Wicomoco & Pocomoke R. R. 4-8½ g. 23 m. 2 lo. 38 c.
H. R. Pitts, *Supt.*.....Berlin, Md.
Williamstown R. R. 4-8½ g. 10 m. 1 lo. 6 cars.
Sam'l Garwood, *Supt.*.....Williamstown, N. J.
Wilmington & No'n R. R. 4-8½ g. 77 m. 13 lo. 148 c.
J. H. Simpson, *Gen. Supt.*.....Coatesville, Pa.
George Rommel, *M. M.*.....Coatesville, Pa.
Wilmington & Weldon; Northeastern S. C.;
Cheraw & Darlington; Cheraw & Salisbury; and
Wilmington, Columbia & Augusta R. Rs.
5 g. 516 miles 71 locomotives 942 cars.
R. R. Bridgers, *Gen. Man.*...Wilmington, N. C.
J. F. Divine, *Gen. Supt.*.....Wilmington, N. C.
John Bisset, *M. M.*.....Florence, N. C.
W. H. Day, *M. C. B.*.....Florence, N. C.
C. R. Chase, *M. C. B.*.....Wilmington, N. C.
Rich. & Petersb. R. R. 4-8½ g. 25 m 8 lo. 130 cars.
Theo. D. Kline, *Supt.*.....Richmond, Va.
John O'Brien, *M. M.*.....Richmond, Va.
H. L. Carter, *M. C. B.*.....Richmond, Va.
Windsor & Annapolis Ry. 4-8½ g. 130 m. 10 lo. 156 c.
P. Innes, *Gen. Supt.*.....Kentville, N. Y.
Wisconsin Central R. R. 4-8½ g. 480 m. 31 lo. 783 c.
F. N. Finney, *Gen. Man.*.....Milwaukee, Wis.
J. W. Cutler, *Pur. Agt.*.....Milwaukee, Wis.
J. B. Heuney, *Supt. M. P. & M.*..Stevens Point, Wis.
Mil. & E'n Divs. : C. F. Dutton, *S.*Milwaukee, Wis.
W. & No. Div. : A. Campbell, *S.*Stevens Point, Wis.
Wood River Branch R. R. 4-8½ g. 6 m. 2 lo. 4 cars.
L. M. Barber, *Supt.*.....Hope Valley, R. I.
Woodstock R. R. 4

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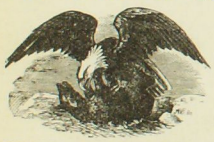

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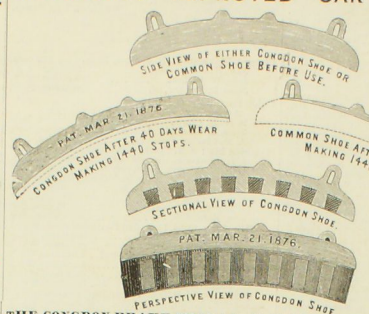

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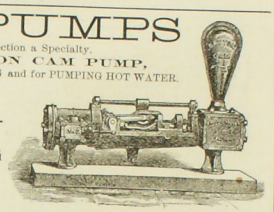

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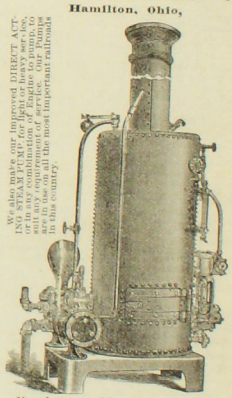

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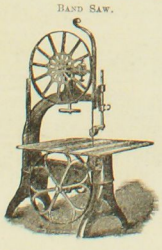

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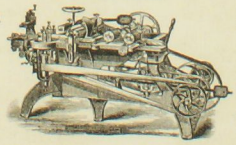

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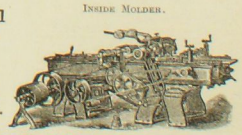

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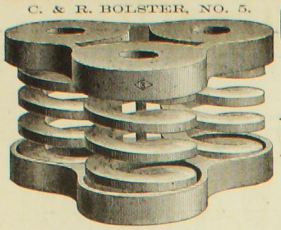

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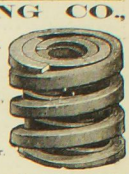
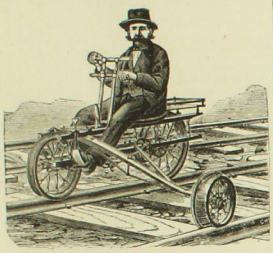


The Sheffield Velocipede Hand-Car.



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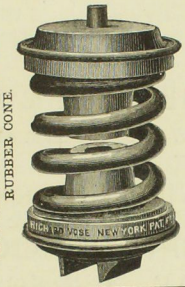

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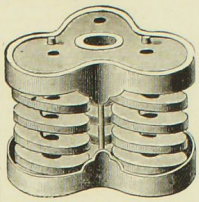

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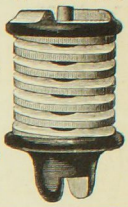

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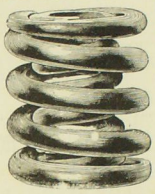

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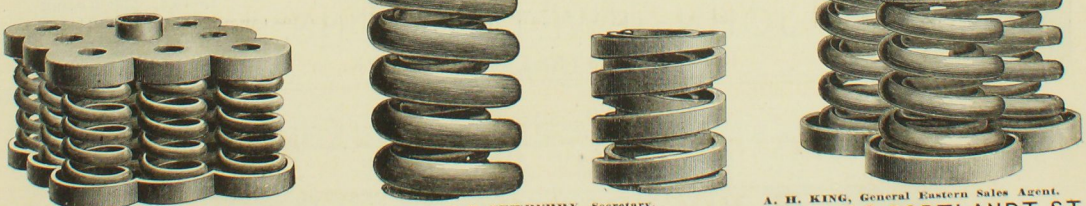

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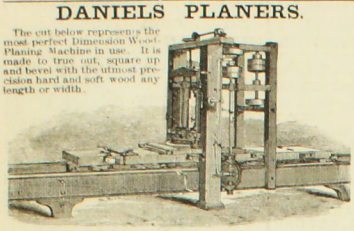

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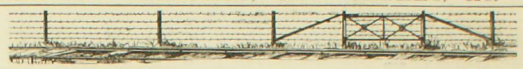

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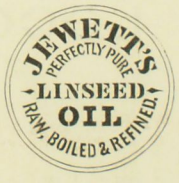

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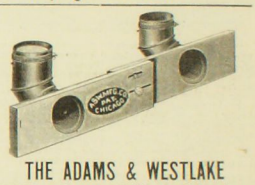

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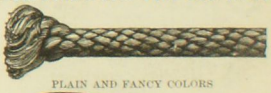

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